

## NEWS IN BRIEF

Redifon's  
56% rise

KEY-TO-DISC manufacturer Redifon Computers has announced a turnover of £11 million for its 1976-77 financial year which ended on March 31. This is 56 per cent higher than in 1975-76. About 45 per cent came from sales in Eastern Europe where Redifon's strongest markets are Poland and Czechoslovakia (CW, June 9). Pre-tax profits, at £1,708,000, were 28 per cent up on the previous year.

## Sit-in ends

SIT-IN at Plessey's Kirkby, Liverpool, factory has ended following a mass meeting decision last week. A total of 136 people were involved, demanding better redundancy terms, and about 60 of these have shown an interest in vacancies at the company's Edge Lane and Huyton plants.

## Prices down

PRICES of Digital Equipment's LA-36 DECwriter keyboard/printers sold by Data Dynamics have been reduced to £1,055 for single units and £995 for quantities of 50.

## Giro contract

A CONTRACT worth £1.5 million for the supply of personalised stationery to Giro account holders has been won by Rockfort-Thompson of Newbury, Berkshire.

## Range extended

EXTENDING its Reality range of file management systems up and down, CMC has introduced the Reality-5 for low volume applications and first time users, and the Reality-50 which can be supplied with up to 200 Megabytes of disc storage.

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## Digico's answer to US-built megaminis

MOVING up market, Digico has announced its answer to the US-built megaminis. Called the MTS16E, the 'Digico processor can be supplied with up to 2 Mbytes of main memory and can handle a multi-terminal system with up to 32 users.

The MTS16E is upwards compatible with existing Digico minis, including the Micro 16E introduced last year (CW, September 30, 1976), which Digico has renamed the M16E.

But the MTS16E incorporates several power boosting hardware differences.

Most important is a hardware memory mapping unit which can provide each terminal user with up to 64K bytes of main core and can switch memory blocks between users in four microseconds. This is part of a three-tier

memory management operation involving system, user and terminal slots. Common subroutines and communications protocols are nested in the user slot.

Digico points out that the memory allocation and scheduling system is supported by its standard multi-programming system and is transparent to the user.

Other MTS16E features include additional instructions to handle up to 16 levels of vectored interrupt and a 10 slot multi-programming executive. Interactive multi-terminal extended BASIC is offered for applications programming, and can be used more effectively than with other Digico machines. The MTS16E also comes with high speed floating point hardware.

MTS16E system prices range from £20,000 to £100,000, and Digico quotes £980 for each 32K bytes of RAM. Disc storage can be expanded up to 270 Megabytes, and Digico can supply customers with its own Regent disc drives.

The first MTS16E customer is Loughborough University, which is paying about £20,000 for a four-terminal configuration with a 192K byte main memory and 11.2 Megabytes on disc. It will be used in the Department of Library Information Studies.

One of the latest companies to install a Digico M16E-based system for commercial data processing is Continental Wine Experts of Norfolk, which manufacture wine-making kits.

Decision tables  
draft 'inadequate'

By Stephen Bell

A STANDARDS document on decision tables, published by the British Standards Institution last week, is likely to attract heavy criticism.

Several points of the standard were criticised by decision table experts when it was still in its draft version. Publication of the final version shows that many of the criticised points remain unaltered, or have simply been evaded.

These shortcomings are particularly worrying, the critics contend, since the BSI document is intended as the basis for a projected international standard.

Decision tables are an increasingly widely adopted and convenient method of expressing the logical connection between the replies to a number of questions and the actions to be performed as a consequence of the replies.

While decision tables have been used manually, they have proved particularly appropriate as an expression of the decisions to be taken in a computer package or language.

DELIVERY of an IBM Series 1 to CAP UK's offices in Bloomsbury, London, last week emphasised the company's commitment to develop software for the machine (CW, May 26).

The configuration acquired by CAP has 84 Kbytes of memory, a combined disc/diskette unit, a matrix printer, teletype channels — the first example of an IBM-provided connection to a non-IBM device — a visual display terminal and a general-purpose I/O channel for attachment of unusual peripherals.

Most of the initial applications of the IBM minicomputer are expected to be in distributed processing. CAP expects that a large number of its clients, already using IBM mainframes, will be encouraged by the Series 1 launch and the general trend to distributed processing to look seriously at the machine. This would provide CAP with a large potential market.

CAP intends to produce a

FINANCIAL results for the second quarter of 1977 from supercomputer manufacturer Cray Research include turnover and net loss figures of \$577,327 and \$934,208, while the figures

## Cray Research financial results

for the first half of the year were \$1,036,301 and \$1,121,776, respectively. Most of the turnover came from leased system rentals and Cray expects to install two more machines soon.

## NCC rule changes planned

AN extraordinary general meeting of members of the National Computing Centre is to be held within the next six months to discuss changes to the Centre's constitution which will increase member representation on the council.

The changes are needed because the NCC's annual grant has now been replaced by contracts for specific projects (CW, March 17). Given this increased government independence, the NCC now believes it is inappropriate to have the Department of Industry nominating half its council members.

The need for constitutional change was discussed last week by the NCC's chairman, Professor James Merriman, at the Centre's annual meeting.

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Southwark  
goes for  
a 2970

ONE of the councils leaving the London Boroughs' Joint Computer Committee, Southwark has ordered a 2970 from ICL. The machine will cost £800,000 a year, compared with the £500,000 which Southwark estimates it would have had to pay to stay in the consortium; but it says the bigger system will enable it to run many more systems of a non-financial nature.

The order redresses the balance towards ICL a little, as Bexley and Kensington and Chelsea have ordered IBM 370/138s.

The fourth borough in the consortium, Greenwich, hopes to co-operate with Westminster, using the city council's computers.

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## Briefing

France  
boosts IC  
production

THE French government is to spend 120 million francs, £14.5 million, a year over the next five years to build up integrated circuit production. The annual figure will be indexed for inflation, and is double what the government has so far spent each year in support of the integrated circuit industry.

A commission has been set up to put the support plan into action, and it is due to report by the end of November on how the money should be shared out.

## ICL dispute

TALKS resume next week between ICL and unions in a bid to solve a dispute over a proposed self-financing productivity scheme (CW, August 4). This follows a threat of industrial action by members of APEX, EESA, ASTMS and ACTSS.

Southwark will convert as many financial systems as possible from the System 4.

## £60,000 grant

THE National Westminster Bank is to install IBM 3033s at its new London computer centre as replacements for old 360s. The bank would not say how its needs would be met but it is now in negotiation with IBM.

The 3033 draw, back page.

## Natwest's 3033s

THE National Westminster Bank is to receive a grant of £60,000 from the Department of Science and Education to provide a general information service on computer assisted learning. Roger Miles, assistant director of the National Development Programme in Computer Assisted Learning, which ends its five-year life in December, will be in charge of the new service.

• The 3033 draw, back page.

## Philips chuffed

ORDERS worth over £1 million were won by Philips Data Systems during a 13-city promotional journey by train called "DataTrain". Delegates from over 1,500 businesses attended the demonstrations last month.

• Turn to page 7

## B3800 additions

CLOSELY following the two new low-cost B3800s, Burroughs has announced two additions to the B3800 line, the B3834 and the B3835. The first is available for immediate delivery in the first quarter of 1978; no further details are yet available.

The only staff on duty were two night shift operators, who escaped unharmed.

About 20 data prep girls work

## Rapid results

THE EEC Council of Ministers has approved the European Space Agency's plan to connect research centres in the UK, France and Germany to CERN in Switzerland, by high-speed satellite data links. The plan will enable physicists in the three countries to get rapid results from experiments carried out at CERN, the Centre for European Research into Nucleonics.

• Turn to page 7

Papermill blast ruins  
data prep department

THE data prep department was virtually destroyed and the rest of the computer installation put out of action when a central heating boiler blew up at the Bowater-Scott papermill at Gravesend, Kent, during the early hours of Tuesday.

The only staff on duty were two night shift operators, who escaped unharmed.

• Turn to page 7

## Risky business

Computer service companies are

risky investment prospects. This is

the gloomy news from a stock

broking firm which has produced a

report on the industry for the City.

And the report shows how the

market has to be dominated by

a few very large companies.

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## Court action

A US court has been asked by

EMI to stop a US firm, Pfizer

Medical Systems, from using

EMI inventions in the manu-

facture of computerised medical

X-ray scanners. The suit is



# Banks' problems and successes

by Chad

## Which finger on the button?

THE first few IBM Series models to arrive in this country reveal a curiously non-ergonomic distribution of controls.

A prominent feature of IBM's 360s and 370s is a large "emergency pull" button on the console, which shuts down the whole machine instantly in the event of a catastrophe. On the Series 1, this button is not on the console, but at the very top of the machine, about six feet from the floor. It would be interesting to "benchmark" the delay caused by this placing and its possible consequences.

The on-off switch on the floppy disc unit appears to be intended for operation with the knee. If it is placed at the same height on all machines, Series 1 operators should soon be complaining regularly of back-ache.

Still, perhaps we are being unfair to IBM. The company is, after all, unused to designing tall thin computers. The machine is also modular, so possibly those we have seen



"She's a Series-1 operator, I think..."

## Pork chop logic

EDINBURGH University scientists have come up with the perfect pig — a computer simulation which does everything but grunt. The development could revolutionise the pig farming industry, allowing nutrition research which normally takes a couple of years to be carried out in a matter of hours.

Dr Colin Whittemore, of Edinburgh University School of Agriculture, helped by a mathematical economist and a computer "expert", built the computer to carry out animal production experiments without the aid of animals.

The system incorporates a complex series of equations representing the biochemical

## Brought to book

A FOOTNOTE to Computer Weekly's call for action to spread the gospel about computers among the gentiles: my Bristol scout reports the following from a local newspaper.

I quote:

"When a suggestion was made today to investigate the use of a computer system into the Avon County Library Service, Councillor Don Rippon expressed the gravest doubts about whether society had gained very much from computers... He said he had lived with computers for the last ten years and called them a useful adaptation to a clerk with a pen. But whether they

had improved on the chap with the pen was another matter, especially over accuracy in accounting.

"He warned his colleagues on the county's community leisure committee that while the computerised age was with us, if a computer were introduced into the library service it would not necessarily save money, for it would call for expensive equipment and highly skilled and specialised staff. The committee agreed to an investigation, provided this in itself did not cost too much."

I wonder if the Avon library service has an up-to-date book on the subject?

**Univac scores at Ayr**

VISITORS and journalists at the Open Golf Championship at Turnberry, Ayrshire, last month, were saved the drudgery of tramping round the course to follow the stars' progress, thanks to Univac.

The company installed three DCT 500 terminals at the course. Results were telephoned to the central control room. They were input to a terminal there and transmitted to other terminals in the visitors' tent village and the Press centre. So journalists were able to write

in his weekly column Focus takes a down-to-earth, and sometimes acerbic, DP manager's view of various aspects of the computer scene. When he wrote about banking systems (CW, July 17), his comments were not very favourable. Here Charles Read, director of the Inter-Bank Research Organisation, takes up cudgels on behalf of the banks. He describes the systems that have been developed and are being operated by the UK Clearing Banks, and outlines some of the successes that have been achieved.

Mr Read writes: I was very surprised to read the Focus article which roundly attacked all aspects of banking systems.

If your correspondent wishes to contact me, I will be delighted to point out a number of serious errors of fact contained in the article (for example, changing a standing order takes from one to four working days, not the "prescribed six weeks").

I do not intend, however, to pick over the bones of your correspondent's many complaints, but rather to indicate the true nature, scale and general efficiency of the branch banking systems currently being operated by the Clearing Banks in this country.

Firstly, it should be said that bank computer systems are not beyond criticism. The core of current systems was designed some years ago and it is true of all major systems that, with the benefit of hindsight and taking full account of the rapid changes in technology and techniques, a second attempt should be better than the first, but to start again from scratch is hardly practicable and a process of continual review and evolution should be, and is being, undertaken.

Returning to my theme, however, I feel that it is often not appreciated that the major constraints on banking systems result not just from complexity, but rather from the sheer scale of operation. The number of cheques and other types of payments received by the Clear-



Charles Read

ing Banks on a single day often exceeds 10 million.

In addition, unlike building societies, the Clearing Banks have taken steps to ensure that their customers do not have to go back to their own branch, for example, to draw out cash, but can use whichever bank branch happens to be convenient. With a combined total of over 10,000 branches covering the whole country, the need to maintain this flexibility of service often constrains the system options available.

The British Clearing Banks, therefore, have a systems problem which is literally unique. The daily volume of transactions (with peak rates of perhaps two million transactions an hour) is, as far as I am aware, very much greater than the volumes dealt with by any other system or group of systems anywhere in the world.

## Kaissa is defeated

THE second world computer chess championship opened last Sunday at IFIP in Toronto with a shock defeat for the world computer chess champion, the Russian program Kaissa.

Kaissa, running for the first time on an IBM 370 instead of an ICL System 4, lost to the No 9 seed, Duchess, from the American Duke University.

Real porkers, that is: only

the Muppets can produce that epitome of porcine sophistication, Miss Piggy.

**Book the date!**

## NEWS IN BRIEF

### IBM to buy 2.5m more of its shares

FOLLOWING the purchase of over 2.5 million of its own shares at \$280 apiece earlier this year (CW, March 17), IBM has announced that it is prepared to spend up to \$700 million to buy up to 2.5 million more.

It will buy shares offered to it from time to time at not more than the going market price, but is not interested in blocks of less than 5,000.

AGREEMENT has been reached on a new bid by Moore Corporation subsidiary, Moore Business Forms for the preference share capital of Lanson Industries.

UP to 18 SyFA minicomputers, hosted by an IBM 370/188 in California, will provide a data network spanning three continents under a contract signed by Computer Automation, manufacturers of the SyFA system, and the Fairchild Camera and Instrument Corporation.

RELEASED at the NCC in Dallas last month, Zygomatics of Chesham, Bucks, now includes the Diablo HyTerm Matrix Terminal in its product range. The terminal operates at 120 chps, and Zygomatics has modified it to provide isolation to comply with Post Office regulations to enable it to be connected to P0 modems.

### Open day

An open day has been orga-

nised by Univac at the West London Stadium which, they say, is open to everyone. It's on Sunday August 14, and for the really enthusiastic it starts at 9.30. Among the activities

there are a six-a-side football tournament, a beauty competition, and welly throwing. In the evening there is to be a disco with a talent competition.

The stadium is in Dr Coss Road, near Wormwood Scrubs Prison, and anyone who wants to take part in the various contests or to offer teams for the soccer should contact John Trondall on 01-238 1010, extension 315.

The resulting system is both

cost-effective and very efficient. Your correspondent is badly informed about the number of errors, which is so small as to look ridiculous in percentage terms, and, in addition, the vast majority of the tiny number of daily errors are detected and corrected by branches.

Banks are not complacent about their current systems; indeed they are continually seeking ways of providing a better service, although always at a price customers are prepared to pay.

### Calcomp to produce Solar line under licence

MORE details have now emerged about the agreement between Calcomp and SEMS under which Calcomp will incorporate Solar minis from the French company into a new line of off-line plotting systems (CW, May 12).

The initial batch of Solar minis has come from France, but under the agreement, Calcomp gets the right to manufacture the Solar line under licence, for incorporation both into the graphic systems and into other future Calcomp systems. In addition, if SEMS decides to market the Solar and Mitra lines in the US, it will be able to make use of Calcomp's service and maintenance network.

SEMS uses Calcomp's Trident

disc drives with its minis, but a Calcomp spokesman in California told Computer Weekly that the minicomputer agreement was unconnected with the sale of disc drives to SEMS.

Faulkner and Dr Kates looked

at both the international and the nationalistic aspects of the information processing society. Faulkner called for the development of international "ground rules" to control the import and export of information processing services.

While not wishing unfairly to hinder free competition, he stressed it was important for countries like Canada, to maintain an independent information technology capability.

"We cannot afford to be governed by interest groups in other countries," he said, aiming his remarks particularly at international processing networks and bureaux.

Dr Kates continued this theme by propounding the concept of technological sovereignty. This concept he said, had been adapted by the Science Council of Canada as the prescription to Canada's difficulties of ensuring for itself an independent status in the global community.

17-hour trek

The Canadian air traffic controllers strike could cut the IFIP attendance by more than 1,000.

Conference organisers were expecting between 4,000 and 5,000 delegates to IFIP and its associated Medinfo conferences. Early on Monday, the opening day, about 2,100 delegates had registered and the organisers were still hopeful of an attendance of about 3,500.

The strike started on the Sunday before the conference and meant that non-Canadian visitors had to fly to the nearest US airport. Visitors from London were faced with a 17-hour bus trek via Detroit.

Tickets £12 each.

Dinner, Cabaret and

Dancing until 2 am.

Details from Tony Higgins

Computer Weekly, Dorset House,

Stamford Street, London SE1 9LU

● Coupon on page 13

## OP SPOT

### Fading away due to lack of recognition

THIS week a reader comes up with a solution to the question: What happens to old operators?

individual? I suspect that, in the main, they only know the strength of a shift as a whole.

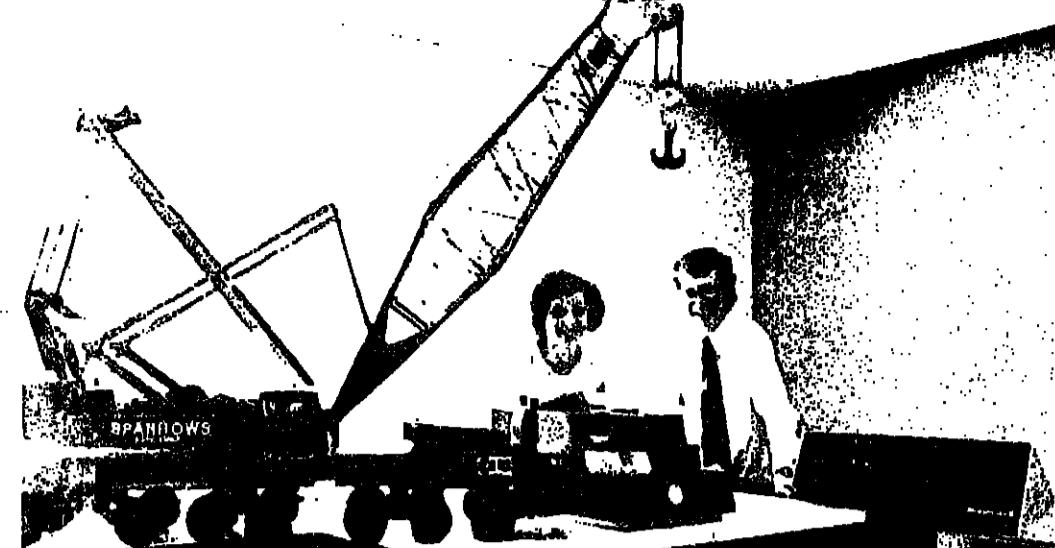
"Therefore I submit that many operators fade away simply due to lack of recognition and financial reward commensurate with ability."

Shales comments: "I believe that operators, in a lot of cases, are never given the merit or demerit due to them. I think it must be accepted that operators on shift are a part of a team, but they are consequently always judged as such."

"You often hear the phrase 'the night shift' or 'Nimrod's shift'. If something goes wrong, or if a problem is resolved with a good deal of expertise, very rarely is the credit given to the person directly responsible."

"While I accept that operators need to be intelligent, I would say that aptitude is equally or more important. How many times do you read an advert for operators' jobs which insist that applicants should have an 'A' level education? By that one statement, I would say that the field of applicants becomes much more limited and, just because a person has 'A' level qualifications, it does not mean that he is ideal for the job."

"After all, despite his 'A' levels, he may still not possess the aptitude for the job. If he does possess both aptitude and 'A' level intelligence, he will soon become dissatisfied, and if there are no openings for progressing, he will become bored, and may leave the industry altogether."



management and clerical functions of wages and salaries, payment of suppliers and sales and purchase ledger. All these programs have been converted from the IBM versions to allow running on the 62/20, which is a basic system equipped with 38K of mass memory, 40Mbytes of disc, a 200 lpm printer and 96 column card reader.

● Jim Brown, the company's data processing manager, is pictured with Christine Murray in the new installation.

## European PTTs offer links to US databases

FOLLOWING the lead set by the UK Post Office (CW, August 4), several other European PTTs are offering links to US databases.

The Dutch PTT has now installed a Tymnet CP-2 concentrator, based on a Varian V72 mini, and has begun offering an access service to databases on both the Tymnet and Telenet networks.

The French and Belgian PTTs are also offering the service; Switzerland plans to introduce it this month; and Spain and West Germany later in the year.

Tymshare Corp, which operates the Tymnet network, describes it as "a packet but not a packet-switched network". The user is not involved in packet assembly and disassembly, but data is sent for several destinations and multiplexed together at each node in the network. There are four network control centres, but only one is active at any one time.

Early Tymnet nodes use the Varian 620/1 mini, and Tymnet has been right through the Varian line to the V72, but now uses Interdata 7/32s.

### Distributors

IN the article by Nicholas Benwell, "Deciding on the right magnetic peripherals" (CW, July 7), the name of a former distributor of the Comel Computer Systems Stockeller was inadvertently given. Distribution is at present handled by Comel, but arrangements are now being completed for the appointment of new distributors.

## UCC answer to the mini threat

RECOGNISING the threat to

service bureaux from minicomputer systems houses, the University Computing Company has introduced what it calls a Total Service for its customers

of Service-3 introduced by UCC about 18 months ago. Under this the client combines local data entry and inquiry with batch processing at UCC, but he still selects, buys and installs the mini system himself. Ventek's Datapoint is one of the most favoured.

Although UCC's business from commercial clients is growing rapidly technical organisations still provide more than half its work and, according to Harries, a mini with Fortran would be selected for Total Service technical clients. Their batch runs at the UCC utility would typically involve big structural analyses.

London. The other client is in Ireland.

John Harries conceded that the Total Service concept was not completely new, but said that UCC was the first to offer it in practice.

Under this, UCC supplies the client with a minicomputer system for local data entry and interactive file inquiry while continuing to process its big batch jobs at the UCC utility, all for monthly charge.

The aim is to combine the best features of the in-house mini system and the service bureau.

UCC director of client services, John Harries, explained that under Total Service UCC selects the minicomputer system needed by the client, buys all the hardware, and installs it at the client's site. The customer's only capital expenditure, according to Harries, is on the interactive software UCC develops to interface the client's terminal operators with files on the mini system and at the UCC utility.

Batches of data created during the day are transmitted to UCC at night for file updating.

Harries said that Total Service is aimed at both technical and commercial users and can be offered as a less expensive and less complex alternative to a stand-alone in-house system like the ICL 2003, IBM System 3 or a medium to large mini configuration. In some cases it could be more effective than an in-house mainframe.

Total Service is a development

of Mitra minis at the CII factory in Toulouse, which builds the former CII line for SEMS, also increased. More than 300 systems were delivered in the first half of the year, and the installed base now exceeds 2,500. By comparison, DEC is currently building PDP-11 series minis at a rate of over 2,000 a month.

Almost 30% of the business placed with the company came from outside France, but under the agreement, Calcomp gets the right to manufacture the Solar line under licence, for incorporation both into the graphic systems and into other future Calcomp systems. In addition, if SEMS decides to market the Solar and Mitra lines in the US, it will be able to make use of Calcomp's service and maintenance network.

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# Rapid growth seen in floppy disc market

THE number of units shipped by the floppy disc drive industry worldwide will increase by 33% a year over the next five years according to a study\* from the Venture Development Corp, a Massachusetts-based consultancy specialising in the electronics industry.

The study predicts that the actual numbers shipped will grow from 145,000 in 1976 to 605,000 in 1981, and that sales of all types of drives will increase apart from full-sized non-IBM compatible models, sales of which will dwindle to nearly zero by 1981.

Sales of IBM-type drives from OEMs for non-IBM systems will grow from 103,000 units in 1976 to 392,000 in 1981. The study sees 75% of all floppy disc drives shipped by then having double density data recording. Double sided drives will account for 40% of all shipments by 1981.

Other trends include a rapid growth in sales of minifloppy

## SOFTWARE FILE

EDITED BY STEPHEN BELL

# Critic of decision tables standard gives reasons

FOLLOWING last week's news of objections to the British Standards Institution's standard for decision tables (CWS, August 4), one of the foremost critics, Peter M. Bell, has itemised his criticisms of the standard. Bell has extensive experience of decision tables, having produced his own package, Oxtab.

He writes:

Decision tables are the subject

of a British Standard published

at the end of July "Recommendations for Decision Tables used in Data Processing" (BS 5487:1977).

One might have expected the

standard to start with clear-cut

definitions, to work through a

crisp exposition, and to end by

demonstrating the proof of what

had gone before. Not a bit of it!

The standard starts cautiously, as if suspecting some inexplicable truth to emerge, edges its way round some basic misconceptions, and finally provides examples to prove that, given these misconceptions, a "balancing item" is needed (in the form of an ELSE rule) to achieve the proof.

The enhancements, expected later this year, will increase the amount of information immediately available to the user on the data stored within the system, and will also simplify the immense task of initially building a data dictionary to be kept up to date.

Cincom recognises this view, and UK operations manager John Hale pointed out that a new facilities will be an interface to allow the automatic updating

of the data dictionary from the information contained in program source-code and database definition modules.

A similar facility has already been implemented for Cullinan Corp's data dictionary (CWS, December 9, 1976). Although this clearly eases the construction and maintenance of the dictionary, some data dictionary experts have pointed out that it places dictionary update capability in the hands of the programmers. This, they contend, should be the province of the database administrator.

Online updating of the dictionary will also be provided, input being through 3272 or compatible visual displays, under the control of Cincom's Enviro/1 teleprocessing monitor.

The Cincom data dictionary is

chiefly intended for use with the company's Total database.

Consider a condition expressed in a decision table as:

CODE = A YN

The condition states for this condition are:

CODE = A

CODE = NOT A

Consider two conditions expressed in a decision table as:

CODE = A YNN

CODE = B YN

CODE = NOT A AND NOT B

Consider these two conditions expressed in a decision table as:

CODE = AB

Clearly, the condition state "NOT A AND NOT B" is not represented above.

There is no acknowledgement in the standard of the NOT condition state described above.

For this reason, an extended entry decision table is found to be incomplete when converted to a limited entry decision table; a situation promptly resolved by including an ELSE rule in the latter table.

For readers not aware of the function of the ELSE rule, the standard offers no enlightenment: it is not defined. There is, however, a recommendation that:

"alternatively, the condition entries in an ELSE rule are represented by dash symbols"

which, in conjunction with an earlier statement:

"the dash symbol '-' as a condition entry indicates that the condition is either irrelevant or impossible"

must make the ELSE rule either wholly irrelevant or wholly impossible.

On the other hand, the rule

of restriction confers the benefit claimed for it, or does it merely handicap your programming efficiency and style?

Should all programmers be allowed to use the full facilities available in their compiler?

Does your installation insist

on using an ANSI or other "standard" compiler? If so, why?

Does the compiler have extensions to the standard?

Are you and your fellow programmers allowed to use the language to its full potential, or are you restricted?

One of the reasons for the evolution of extensions is doubtless the age of some of the standards. A coherent picture of the extensions that programmers consider necessary may well be of help in influencing decisions on the features of future standards.

Leading on naturally from this topic is the general question of restriction of the language repertoire. Many installations rigidly exclude their programmers from using certain language features; not in the cause of portability, but in the hope of producing better programs.

The survey authors suggest

that installations concerned

with standards should exclude

these non-standard extensions

or, at least, single them out in

documentation as non-standard features.

Do you believe that this kind

of needle, one centimetre long,

is dropped at random on to the

centre of a large flat surface

crossed by parallel lines, all one

centimetre apart, what is the

probability (expressed as a fraction), that it will come to rest

across one of the lines?

See page 31 for solution.

# SBS seeks third earth station

THE Satellite Business Systems consortium, composed of IBM, Comsat and Aetna, has applied to the US Federal Communications Commission to build its third earth station at IBM's Research Triangle Park near Raleigh, North Carolina. The station, required for

communications for the Redifon Seecheck key-to-disc system, will be a decentralised system with 20

keystations in computer user departments, all generating data for processing on a 370/158.

Redifon has also won three local government orders. All the systems replace ICL data preparation equipment.

The customers are Dorset County Council, with a 24-terminal system with two 5-Megabyte disc drives; West Midlands County Council, with 16 terminals and one disc; and Wexford Water Authority, which is getting four terminals and two discs. Total value of the orders is over £150,000.

The Seecheck at GEC Measurements at Stafford will be a decentralised system with 20

keystations in computer user departments, all generating data for processing on a 370/158.

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## Microprocessor News

### Upgraded SBC-80/20 on offer from Intel

TWO upgraded versions of the SBC-80/20 single board OEM computer are now available from Intel.

The standard SBC-80/20 is now produced with 8K bytes of program memory on board, in place of 4K bytes. Also available is the new SBS-80/20 which has the read/write memory upgraded from 2K to 4K bytes. Both are being sold at the same price and Intel consequently expects to offer considerable savings in its costs in a number of medium scale applications.

These range from process control operations, where the doubled memory capacity is expected to be of particular benefit, through to front-end processing, intelligent terminals and distributed and multi-

processor computing systems. The other features of the SBC-80/20 are retained in the upgraded versions, including the bus arbitration control system. This allows up to 16 80/20 computers to share the same databus by providing automatic resolution of any conflicts that arise when two or more machines attempt simultaneous control of the bus.

In addition, several hardware problems, such as interface design, interrupt structure and control, and communications protocol are eliminated by using software control.

For systems requiring greater memory capacity than that held on the new CPU boards, additional memory cards are also available.

### SC/MP retrofit kits from National

USERS of the National Semiconductors SC/MP microprocessor will now be able to evaluate the new SC/MP-II version of the device, following the introduction by the company of retrofit kits.

The kits have been produced to allow qualitative and quantitative comparisons between the two devices and differ primarily in terms of operating speed and power dissipation. The new SC/MP-II version is claimed to operate at 4MHz, twice the speed of the original, while dissipating approximately 25% less power.

An additional improvement is the change in power supply requirements. The original SC/MP needed a +5 volt and

### Short courses at Hatfield

A SERIES of short courses on programming for microprocessors are to be run by the School of Information Sciences at Hatfield Polytechnic during the autumn term.

Two courses aimed primarily at engineers with little computing experience, will introduce students to the assembly and editing of microprocessor programs, and offer hands-on experience on a Motorola M6800 based system. The courses are either an eight-session, after noon/evening course, starting October 5, or a 10-session

evening course starting on October 11.

For experienced users, especially those already working with M6800 systems, the Polytechnic is offering a three-session, afternoon/evening course that will introduce the resident software for the M6800 development systems, together with the use of Fortran, Basic and Macro-assembler. Starting date for this is November 30.

Further information can be obtained from the School at Hatfield Polytechnic, PO Box 109, Hatfield, Herts AL10 9AB.

### Greater M6800 throughput

MOTOROLA has increased the operating frequencies of its MC68A00 and MC68B00 microprocessors to allow significant improvements in throughput in systems configurations.

The MC68A00 is now available with an operating frequency of 1.5MHz, while the MC68B00 has been upgraded to 2MHz. Both operate at a minimum frequency of 0.1MHz, and have cycle times set between 0.666 and 10 microseconds.

### South African micro

NOT content with obtaining microcomputers solely from overseas sources, South Africa now has its own indigenously developed product.

Known as the Commander, the microcomputer has been designed and manufactured by Messina (Electronic) Development Co., a subsidiary of the

Messina (Transvaal) Develop-

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Little is known of the equipment's claim that it is more versatile than the standard microcomputer. They are aiming the equipment specifically at applications in mining, industry and commerce in South Africa.

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# FILE DESIGN

By Owen Hanson

Part 7

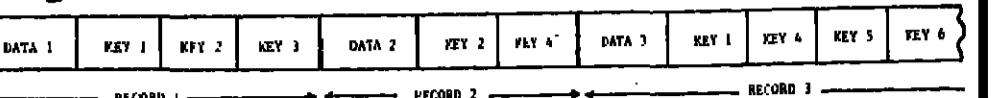


Figure 1a (above): Serial File. Note that keys may be appropriate for more than one record. Figure 1b (below): Note that data will be referred to by the records for each of its keys, but that data will only be stored in complete form once.



MOST data processing applications use a single record key, or at most a limited number of keys. The type of application in which a selection is made from a set of records, based on some input requirements, is an exception to this. There are no longer any particular "keys" as such; instead, the record has to be searched using some combination of keys provided by the user.

Typical selection applications might be personnel or library handling. In the first case, a group of FEMALE employees who can SPEAK GERMAN and are UNDER THIRTY might be required. Employee records would be scanned, using the boolean conditions (Female) AND (Speaks German) AND (under thirty). Records satisfying all three requirements would be selected.

The keys above are fairly definite, although "can speak German" may prove to be a variable ability. In library

and that root words such as INTEGRA\*\*\* should yield a hit with Integral, Integrate, integrated, etc.

Computer systems that provide these functions require specialist files and record formats. All possible keys must be in a predetermined position or sequence, in order to allow searching to be carried out. The format depends on the type of file used.

### Serial file handling

The simplest arrangement of records is to store them in order, with the record first followed by all its keys, in the format shown in Figure 1a.

This file organisation has the advantage that addition of new records is straightforward; they are added at the tail of the file. It is also convenient for boolean testing, as the records are examined one by one to see if their keys meet the conditions laid down.

The disadvantage of this

is that it is necessary to scan the whole of a library, and the selective dissemination of information (SDI) that aims to let users know which new additions to the library collection are of particular interest to them personally.

In the second case each user will have a separate profile of interests, in the form of a boolean expression that is run against new accessions.

The two are different in that an SDI service will handle relatively small files, and a retrospective search usually deals with large ones. A number of commercial systems use the technique shown in Figure 2 to batch input, so that updating of the main file is relatively infrequent.

These services can be useful for personnel type applications, but their main use is in libraries, where a further problem will be the relevance of the retrieved information.

Accession lists are often discarded because pages of irrelevant material have to be read. However, most users would accept one useful article in three or four, and thus a relatively low relevance, defined as (number of relevant documents) + (number of documents retrieved).

Missing relevant articles because they are not retrieved by the system is a more serious problem. This is measured by recall, defined as (number of relevant articles) + (total number of relevant articles). As the user gets no indication of articles the system has failed to locate, it is important that most of the relevant articles should be retrieved, even if this means that the relevance is lowered.

A system will give different results for different inquiries, but the curves shown in Figure 3 are typical of good and bad systems in operation.

For example, using the information in Figure 1, the inquiry (key 1) AND (key 2) would only produce data record 1, while (key 1) OR (key 2) would yield data records 1, 2 and 3. In each case only two records (those for key 1 and key 2) would be referenced.

If the file is large, this allows a far greater volume of inquiries to be handled than is possible using a serial file.

Inverted files pose an update problem, in that records throughout the file are changed when a new data

Figure 2: A system that uses both serial and inverted files. The main file need not be updated with the same frequency that SDI reports are.

applications keys are far more subjective. The easy way to define keys is to use the significant words in the title. However, titles may be intended to be striking rather than informative. Even author abstracts can be misleading.

The safe way to select appropriate keys is to have each article, book, etc., examined by an information specialist in the field, in order to isolate the keys.

However much care is taken, information retrieval is likely to lead to some irrelevant articles being selected and some relevant ones being missed.

Selection of records will be on the basis of boolean conditions such as AND, OR, BUT NOT IF. There should also be provision to broaden an inquiry if no records match the original conditions, or to narrow it if too many records are selected.

Order of keys is also important. MANAGEMENT INFORMATION SYSTEMS are not usually INFORMATION MANAGEMENT SYSTEMS. Other desirable facilities are those that synthesize should be acceptable, i.e. MAIN or CORE STORAGE/MEMORY.

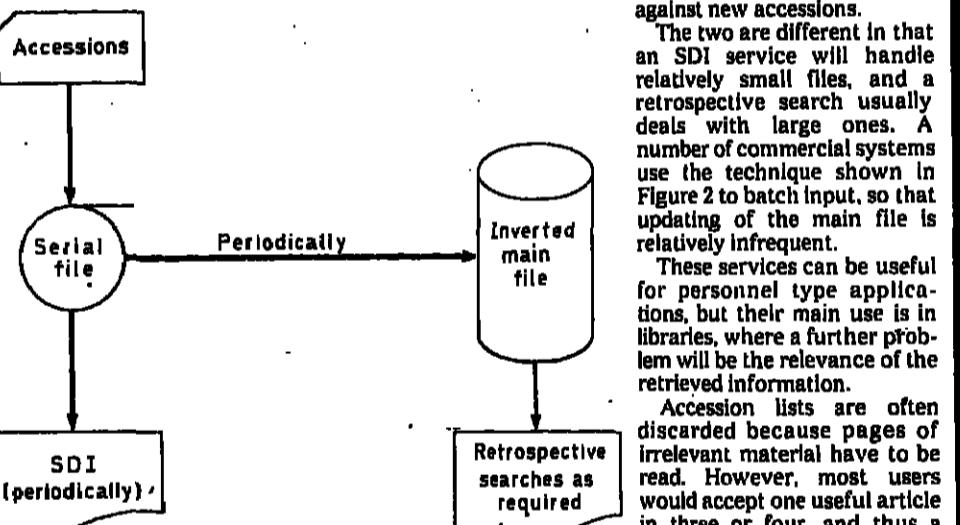


Figure 2: A system that uses both serial and inverted files. The main file need not be updated with the same frequency that SDI reports are.

method is that every record in the file has to be examined, to deal with a single inquiry. When files are small this is not a drawback, but when there are 20,000 to 30,000 records the time taken is so long that it is better to use a different file organisation.

Inverted file handling

In order to avoid scanning every record, the keys and data can be organised as shown in Figure 1b. Using this "inverted" arrangement, the keys given in an inquiry can be checked one by one, and only the relevant keys have to be referenced.

For example, using the information in Figure 1, the inquiry (key 1) AND (key 2) would only produce data record 1, while (key 1) OR (key 2) would yield data records 1, 2 and 3. In each case only two records (those for key 1 and key 2) would be referenced.

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Inverted files pose an update problem, in that records throughout the file are changed when a new data

record is added, if any of the keys of the new record have been used previously. Larger work areas are needed for boolean operations, which limits the complexity of the logical expressions that are allowed.

For many applications — personnel, computer dating, etc — choice of file organisation is a matter of file size. The typical library application is rather different.

PLAN is a very low level

Information retrieval please

Two services that are well suited to computer systems are a Retrospective Search through the whole of a library, and the selective dissemination of information (SDI) that aims to let users know which new additions to the library collection are of particular interest to them personally.

In some cases the reasons may be unavoidable; in others it could well be bad program design, inferior coding etc. But it is not the responsibility of an operator to determine the cause. I think the reasons for this are fairly obvious.

Systems tests, proving runs, operators' comments on the run sheet are all areas where inefficiencies can be highlighted. The proving run is perhaps the best example, when a system is being proved for operational acceptance. This is designed essentially for comments and observations from the operations department.

Finally there could not be a

more appropriate time to highlight the value of "the (important) subjective measures of individual interview, judgment and choice".

It is also good to know that the higher echelons of the Society do not see its role as being solely concerned with the protection of its members' interests.

All that now remains is for the BCS entirely to repudiate the article which originally provoked this correspondence (CW, June 23). In which a spokesman appeared to suggest that this was the case with his claim that "The only safe way open to employers" in the matter of employee selection was to choose members (including students) of the BCS in preference to outsiders, and we can rest assured that the Society is indeed living up to its president's fine words.

Nevertheless, his first and third answers proved most gratifying. It is good to know that the BCS does not claim that membership in itself is necessary or sufficient proof of competence.

A system will give different results for different inquiries, but the curves shown in Figure 3 are typical of good and bad systems in operation.

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Systems tests, proving runs, operators' comments on the run sheet are all areas where inefficiencies can be highlighted. The proving run is perhaps the best example, when a system is being proved for operational acceptance. This is designed essentially for comments and observations from the operations department.

Finally there could not be a

more appropriate time to highlight the value of "the (important) subjective measures of individual interview, judgment and choice".

It is also good to know that the higher echelons of the Society do not see its role as being solely concerned with the protection of its members' interests.

All that now remains is for the BCS entirely to repudiate the article which originally provoked this correspondence (CW, June 23). In which a spokesman appeared to suggest that this was the case with his claim that "The only safe way open to employers" in the matter of employee selection was to choose members (including students) of the BCS in preference to outsiders, and we can rest assured that the Society is indeed living up to its president's fine words.

Nevertheless, his first and third answers proved most gratifying. It is good to know that the BCS does not claim that membership in itself is necessary or sufficient proof of competence.

A system will give different results for different inquiries, but the curves shown in Figure 3 are typical of good and bad systems in operation.

For example, using the information in Figure 1, the inquiry (key 1) AND (key 2) would only produce data record 1, while (key 1) OR (key 2) would yield data records 1, 2 and 3. In each case only two records (those for key 1 and key 2) would be referenced.

If the file is large, this allows a far greater volume of inquiries to be handled than is possible using a serial file.

Inverted files pose an update problem, in that records throughout the file are changed when a new data

record is added, if any of the keys of the new record have been used previously. Larger work areas are needed for boolean operations, which limits the complexity of the logical expressions that are allowed.

For many applications — personnel, computer dating, etc — choice of file organisation is a matter of file size. The typical library application is rather different.

PLAN is a very low level

Information retrieval please

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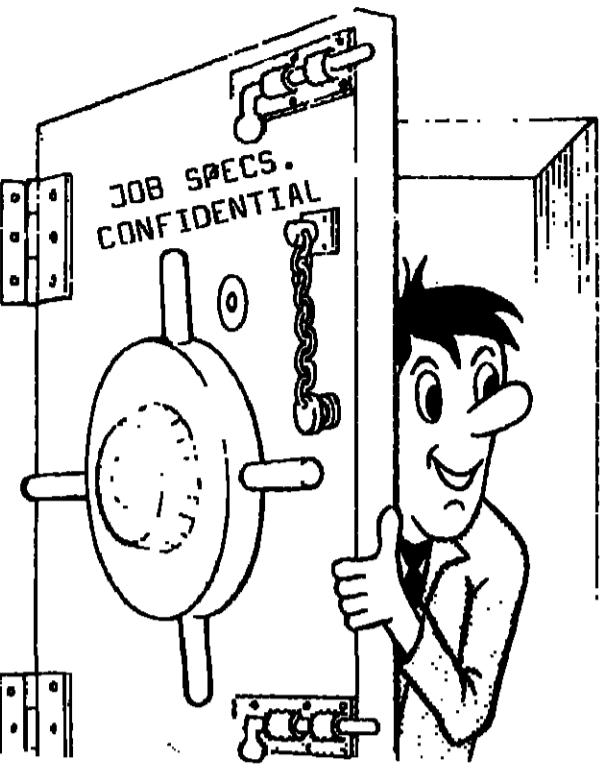
## H. PROGRAMMING & SYSTEMS LTD.

We are the permanent recruitment division of an established Computer Services Consultancy. We have MANY vacancies on our register which may just be RIGHT for YOU. Some of our newest requirements we set out below. Why not telephone our John Lovejoy at Amersham (02403) 22201 or 01-437 3063.

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LONDON - IBM Sys. 3 PRG 11  
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Lancs. - ICL 1902 Cobol  
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AVON SHIFT SUPERVISORS: IBM 370/148, DOS/V3 VM 26k plus £501 shift allowance and very generous relocation expenses paid. OPERATORS: £3.5-24K plus £501 shift allowance.  
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HANTS. PROJECTS MANAGER: IBM 360 Cobol-£8K.  
MIDDX. SENIOR PROGRAMMER: IBM Cobol or PL/I £6.200.  
ANALYST PROGRAMMER: £6.200.  
SYSTEMS ANALYST: £6.500.  
SURREY SYSTEMS ANALYST: IBM 370 PL/I Cobol up to £4.800 + car allowance + relocation expenses and other fringe benefits.  
SUFFOLK SYSTEMS ANALYST: IBM 370 PL/I Cobol up to £4.800 + car allowance + relocation expenses and other fringe benefits.  
WEST MIDLANDS GAS SYSTEMS ANALYST: IBM 370 £4.800.



We are also always happy to hear from D.P. personnel who prefer to work on a CONTRACT & FREELANCE basis and have many opportunities in the UK. Also PERMANENT and CONTRACT programming vacancies in HOLLAND. Please ring our James Barker or Peter Quin on Amersham (02403) 22201 or 01-437 3063.

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## Systems Analysts/Programmers

UK and GERMANY

NAAFI, the 220M commercial trading organisation for H.M. Forces, are looking for experienced staff to join our installations in Nottingham and Krefeld, West Germany. We are also planning to transfer our London installation to Amesbury, Wiltshire, and wish to recruit staff to work in London for a year, or so, before moving to Amesbury. We have a well established systems base and there are plans for further development using mini computers as well as main frames. Current equipment includes Honeywell Series 2000 main frames, Seescheck Key to tape input, and OCR. If you have the right kind of

proven ability in the programming or systems fields, we can offer you a good competitive salary, subsidiary benefits, and modern attractive working conditions.

Please write giving full details of qualifications, experience and current salary to Manager, Personnel Department (PDR/B28/CW), NAAFI, Edinburgh House, 160 Kensington Lane, London, SE11.

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## Thinking of the benefits of working for a growing company? You must be thinking of Systime.

Systime is established as a major U.K. supplier of mini-computer based business systems. Its consistent growth enables the right people to extend their responsibilities, experience and earnings. Its consistent success ensures a working environment that is dynamic and exciting.



### REGIONAL PROGRAMMING EXECUTIVES

to head up the Northern and Southern development teams from offices in LEEDS and WALLINGFORD respectively. These are management positions which carry responsibilities for staff development, staff allocation and quality control. Salaries will reflect the responsibilities and company care are provided.

Applicants must have proven experience in project or programming management, possibly acquired with a software-house or manufacturer.

### EUROPEAN SOFTWARE EXECUTIVE

to be based in the LEEDS or WALLINGFORD offices. Responsibilities will include the evaluation of customer requirements, software contract negotiation, the formation of project teams and subsequent project management for our rapidly expanding customer base in Europe. Previous experience as a project leader in the development of commercial mini-computer systems is essential and a knowledge of French and/or German would be advantageous.

Write giving career details, to D. H. Montgomery, Systems Director, Systime Limited, Concourse Computer Centre, 432 Dewsbury Road, Leeds LS11 7DF or phone the Systems Secretary on Leeds (0532) 70741 for an application form.

## SENIOR COMPUTER AUDITOR

A vacancy has arisen within the Internal Audit Department for a Senior Computer Auditor. The position involves the following aspects:  

- Interpretation of Computer Held Information.
- Participation in Feasibility Studies.
- Regular reviews of existing Computer Systems.
- Audit participation in the development of new Computer Systems.
- Monitoring of Computer activities.
- Liaison with Audit investigations.

 Applicants should ideally have considerable experience of both Audit and Computer activities. The Region runs an extensive ICL 1900 installation, demanding knowledge of PL/I and COBOL languages and ICL activities in general. Knowledge of the NCC FILETAB package would be an additional advantage. Some travel throughout the West Midlands may be necessary, although the position is largely based at Headquarters in Solihull. Applicants should preferably hold, or be studying for, an accountancy qualification. Salary is within the range £4.278-£5.175 per annum plus £31.2 p.a. supplement. Please apply in writing quoting ref. No. CW/A31/3 to:-  
 Senior Personnel Officer (HQ & Marketing)  
 West Midlands Gas, Wharf Lane, Solihull, West Midlands.

WEST MIDLANDS GAS

## SENIOR PROGRAMMER

Salary range: £5,010 to £5,460 p.a.

A computer-based, centralised signalling control system is currently being implemented on the Northern and Victoria Lines. We need a Senior Programmer to work as a member of the implementation project team producing the application software.

Experience in real-time systems is essential, but applicants must also be able to demonstrate at least three years' proven practical experience in programming in both high level and assembler type languages. An appreciation of systems analysis and design techniques is very desirable. A qualification leading to membership of a recognised appropriate institution or Society is also desirable.

If you are interested in being considered write to Staff Appointments and Development Officer (Ref. 270/C/CW), London Transport, 55 Broadway SW1H 0BD.

**LONDON TRANSPORT**

## JBA

SPL International needs Commercial Programmers and Analysts to work on a variety of projects awarded recently to our U.K. Information Systems Division.

Vacancies are mainly in London but, with our overseas business now accounting for more than 50% of revenue, opportunities to work abroad arise frequently.

These positions will appeal to people:

- \* who wish to further their experience by working for one of Europe's largest Software Houses
- \* who are prepared to be mobile and learn new skills
- \* who see themselves spending a period abroad during the next phase of their careers.

## ★ Junior Programmers up to £4,000

If you have at least 1 year's experience in a commercial programming environment, preferably with some Assembler knowledge as well as a high level language such as COBOL or RPG, we are interested.

## ★ PL1 Programmers up to £5,000

We also have a continuous need for programmers who have at least 1 year's experience using PL1.

## ★ ICL/Singer System 10 Programmers up to £5,000

If you know this equipment we have vacancies based in Manchester and Bristol as well as London. Interviews can be arranged locally.

*Fluency in a major European language is always an advantage for overseas work. All salaries by negotiation according to experience. Excellent fringe benefits.*

To discuss these or other opportunities and to arrange interviews apply to:

**JAMES BAKER ASSOCIATES**  
 International Personnel Consultants  
 16 Maddox Street, London W.1. Tel: 01-491 4478

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We have vacancies for two systems analysts to work at our Chief Office in rural North Staffordshire.

The Britannia is the ninth largest building society in the U.K. with assets exceeding £850m and a national network of 140 branches.

We operate a large ICL System 4-72 to provide a real-time video service for our administrative departments as well as a complete batch system covering 760,000 investment and mortgage accounts.

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The ideal candidate will have:

- \* At least two years D.P. experience including systems and programming
- \* Knowledge of on-line systems
- \* Experience of System 4 and financial systems

A salary in the range £3,500 to £4,500 p.a. is offered plus an annual bonus, consultancy mortgage scheme and other benefits; full details at interview.

Write for an application form to:

Mr. Ray G. Newson  
 Assistant General Manager (Personnel)  
 Britannia Building Society  
 P.O. Box No. 20  
 Newton House  
 Wembley Park, Middlesex  
 HA9 7BR

If you require more information, telephone Geoff Preston, Systems Manager, at Lab 0538 286131.

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Up to £4,500

Based Hemel Hempstead

Dixon Limited, the leader in storage and materials handling equipment, require a Problem Solver to maintain and develop their work of design, pricing, engineering and drafting by using mini computers.

The successful man or woman should have one to two years' experience of programming in any high level language on mini computers. Knowledge of assembly language would be useful. In addition, the successful applicant should have sufficient technical aptitude to learn Dixon design techniques.

This is a key job in which the job holder will have a significant impact on the company's efficiency and profitability.

Dixon Limited is a member of Dixon Consulting International Limited, and conditions of employment are those expected from an international organisation.

Please write, giving full details of your career to date, to: David Adams, Personnel Manager, Dixon Limited, Dixon House, Empire Way, Wembley Park, Middlesex HA9 7BR.

Write for an application form to:

Mr. Ray G. Newson  
 Assistant General Manager (Personnel)  
 Britannia Building Society  
 P.O. Box No. 20  
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If you require more information, telephone Geoff Preston, Systems Manager, at Lab 0538 286131.

**SYSTIME**  
 REAL-TIME COMPUTER

A MEMBER OF THE BURTON GROUP

We have installed a brand new Univac 80/80 at our London Data Centre in Hemel Hempstead. It will be supporting a major on-line system and we need to supplement our existing operations staff to cope with this extra workload. Candidates should have the ability to maximise throughput in a busy multiprocessing environment and be able to communicate with staff at all levels.

**SHIFT LEADER** to £4,750 Inc.  
 As shift leader you will have had a good Univac 9000/series 80 or IBM 360/370 background. You must be at least S/L or Sr. Op. level at present and be used to running a shift and carrying all the accompanying responsibility.

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 You must have at least 2 yrs. Univac or IBM experience and be adaptable enough to learn all about our new equipment quickly. You will be expected to deputies for the S/L in his/her absence.

We operate a 3 shift system, Monday to Friday and you will receive all the benefits associated with a large group, including discounts and L.V.s.

Contact MARILYN DAVIDSON on 01-838 8746

**Computer Personnel International**

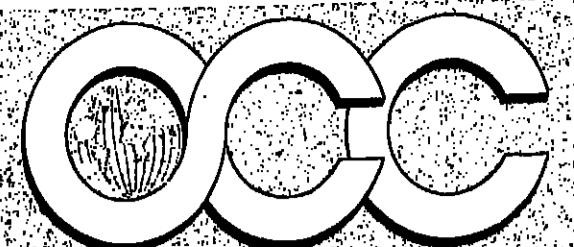
110 St. Martin's Lane, London, WC2N 4BH

**DEXION**

Write for an application form to:

Mr. Ray G. Newson  
 Assistant General Manager (Personnel)  
 Britannia Building Society  
 P.O. Box No. 20  
 Newton House  
 Wembley Park, Middlesex HA9 7BR

If you require more information, telephone Geoff Preston, Systems Manager, at Lab 0538 286131.



## OCC computer personnel limited

### Kent — rural location

### IBM 370-OS Data Centre

Good career prospects — generous relocation package

The Data Centre of this international organisation provides development and processing facilities to group companies in the UK and Europe. Expansion in the work load of the group has led to the need for additional staff as described below:

The development staff are grouped into mixed teams of analysts and programmers — each responsible for new and existing systems on a continuous basis for the various group companies. The work is therefore a mixture of new development, trouble shooting, maintenance and enhancements. Financial and accounting applications form the bulk of the work.

### Senior Programmers

to £5,200

OS COBOL required

Senior Programmers will join a project team and will design, write and implement programs and, on occasion, will supervise small teams of programmers. A minimum of three years' programming experience is needed with a minimum of one year's OS COBOL.

Ref: 244A/CW.

### Programmers

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COBOL on ANY Hardware required

Programmers with a minimum of one year's COBOL experience on ANY hardware are required. Full training will be given in IBM COBOL, JCL, etc. Ref: 244B/CW.

The Data Centre is housed in superb offices in the country and working conditions are excellent. The atmosphere is relaxed and friendly although high standards of work are expected. Career prospects are very good — both at the Data Centre and possibly by transfer to other group companies worldwide. The fringe benefits include a very generous relocation package, flexitime working, subsidised canteen and good social and sports facilities. Reasonably priced housing is available within easy reach.

To apply for these positions, or for further information, please write or phone asking for Neville John, Day: 01-242 9366. Evenings: Farnborough, Kent (68) 52017. If you are interested but you are not sure if your experience is appropriate, please ring for an informal discussion or interview.

Interviews outside normal office hours can be arranged if more convenient.



## Trinidad and Tobago nationals with Data Processing experience

Colonial Life Insurance Company (Trinidad) Limited is one of the leading life insurance companies in the Caribbean. They are expanding their data processing facilities and require:

### Programmer Analysts and Programmers

You should have the following qualifications and experience:

\*Five GCE 'O' Level passes with two at 'A' Level, or equivalent.

\*Formal training in systems and programming.

\*A minimum of three years' in systems and programming. Knowledge of RPG 2 and life insurance experience would be an advantage but are not essential.

Applications, giving full career details plus contact address and telephone number, should be sent as soon as possible to: Box No. CW1480, Mathers & Benson's Advertising Limited, Chancery House, Chancery Lane, London WC2A 1QU.

### Greater Glasgow Health Board

INTERMEDIATE

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Applications are invited for the above post within the Board's Computer Applications Unit. Candidates should have a good knowledge of systems design and experience of supervising staff working in FORTAN and COBOL.

Application form and further details may be obtained from the Personnel Officer, Greater Glasgow Health Board, 351 St. Strathmore Street, Glasgow G2 3HT, to whom completed forms should be returned by Wednesday, 31 August 1977.

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SOCIOLOGY

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Salary scale: £20,000-£23,520.

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post

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**Technical Author****Berkshire**

An international consultancy have a vacancy for an experienced applications software author. The successful appointee will enter a team environment, will be a self-starting, flexible individual with the ability to write clear and concise procedural descriptions. Senior programmers or analysts who can demonstrate a background of self-documented work will be considered. *Excellent fringe benefits are offered.*

Contact: Mike Creamer

**Technical Authors & Engineers****Home Counties/South**

A number of our clients are urgently seeking experienced authors (in some cases graduate trainee authors) to carry out documentation work on a variety of technical computer based systems, or commercial systems (with hardware or software bias). Experienced Computer Engineers, in field support or instructional areas are also sought. *Excellent staff benefits and prospects.*

Contact: Mike Creamer

**COBOL/PLAN Programmers****Middlesex**

A large international manufacturing company are seeking COBOL and/or PLAN programmers with at least 1 year's experience in industry. Recognised large main frame experience is ideal; applicants interested in rapid promotional prospects preferable. *Attractive company benefits and generous relocation package offered.*

Contact: Mike Creamer

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

**JAMES BAKER ASSOCIATES**  
International Personnel Consultants  
16 Maddox Street, London W.1. Tel: 01-491 4478

**Instructor****Herts.**

Our client, a progressive and expanding mini computer manufacturer, requires an instructor to provide training courses in the application of computers to business systems. The successful individual will have considerable experience of business orientated applications including the development of accountancy systems. Additional knowledge in the stock/production control arena would be an advantage. Previous instructing experience is obviously desirable but candidates with the potential, enthusiasm and flexibility of approach to training will be considered. *Excellent opportunity for career advancement.*

Contact: Margaret Stevens

**FORTRAN/RSX11 Programmer****London**

Our client, an international organisation, has a vacancy for a software specialist to work on new systems in the commercial area. Applicants must have several years experience in d.p. and be competent in FORTRAN using RSX11. A commercial or communications background would be preferred. This is an exciting opportunity to join a large well-known company. *Salaries negotiable. Excellent fringe benefits.*

Contact: Margaret Stevens

**APPOINTMENTS**

CPC wish to establish a Central Register of Computer Professionals who are seeking career development

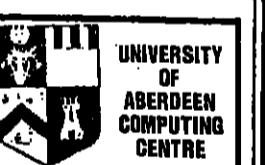
All applicants will be fully interviewed and counselled before admission to the register. Efforts will be made to carry out discussions locally

If you are approximately aged between 23 and 30, have at least two years' experience in a major computing discipline and are either actively considering a change of position or alternatively feel you would benefit from confidential career counselling, we would like to hear from you.

In the first instance please write to me, Patrick Convey, at the address below, giving brief details of your circumstances, experience and career aims. Please give a telephone number and times at which you may be contacted

CAREER COUNSELLORS TO COMPUTER PERSONNEL

**CPC**  
COMPUTER PERSONNEL CONSULTANTS  
4th FLOOR, THE ROTUNDA  
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SALARIES TO £6000

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Comshare - the most dynamic time-sharing business in the UK and part of an international group is growing so fast that we must have our own hardware maintenance service. We can't afford downtime! We're looking for engineers highly experienced in this field to be based at our Chelsea Computer Centre. They have to be tops at fault finding and fixing. But the rewards will match their skills. Our systems run on XEROX SIGMA 9 miniframes with AMPEX memory, CDC 86MB disc drives, POTTER tape drives and DATA PRODUCTS printers.

In addition to maintenance, they will be involved in installation and commissioning of new equipment in liaison with suppliers and also collaborate closely with Comshare's R & D Group in America.

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Computer Engineering Manager, Comshare Limited, P.O. Box 197 London SW3 6RZ.  
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**LECTURER GRADE I** (£2,913-£4,869)\*

MONKWEARMOUGH COLLEGE OF FURTHER EDUCATION

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Applications are invited for the post of LECTURER in COMPUTING AND DATA PROCESSING, with the ability to teach Mathematics to G.C.E. 'O' Level, if required.

Applicants should possess at least Part I membership of the British Computer Society or equivalent qualifications, together with a suitable qualification in Mathematics. Previous teaching experience an advantage.

Application forms and further particulars available upon receipt of a stamped, addressed envelope from the Principal, Monkwearmouth College of Further Education, Swan Street, Sunderland SR5 1EB

Closing date for applications: 22nd August, 1977.

L. BLOOM

Chief Executive

Borough of Sunderland

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Good working knowledge of FORTRAN/COBOL and experience with GEORGE 2 and/or MAXIMOP would be advantage.

Application form, to be returned by 2nd September, 1977, can be obtained with further particulars from the Personnel Officer.

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**PROGRAMMER**  
Salary: £2,822-£4,098  
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Good working knowledge of FORTRAN/COBOL and experience with GEORGE 2 and/or MAXIMOP would be advantage.

Application form, to be returned by 2nd September, 1977, can be obtained with further particulars from the Personnel Officer.

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**Why are CMG always advertising for staff?**

The computer services market in the UK and the rest of Western Europe is growing at between 25% and 40% a year.

This is what is actually sold and not what could be sold if more resources were available.

The growth of CMG since its formation in

1964 has been substantial - Turnover during 1975/1976 was £5.4 millions.

To sustain our rate of expansion which is in line with market growth we will require at least thirty more people in our UK branches during 1977.

**What exactly is a Systems and Programming Consultant?**

Depending upon the requirements of the project to which they are assigned, our staff may be called upon to use any or all of their programming, systems, management and general consultancy skills. We do not separate programming from systems work as far as job functions are concerned.

Whilst at times people will use their experience of specific machines, languages, and applications they will also be required to draw upon their general computing experience and learn new specific skills with the assistance of other experienced CMG personnel. We therefore require people whose prime interest is in developing systems and solving business problems rather than working with specific equipment.

The main job satisfaction is gained from getting work ready within agreed cost and time scales. There is a considerable amount of customer involvement and everyone is expected

to participate in the sales effort of the company. People are given all the responsibility that they can handle and there are unrivalled opportunities for promotion, all of which is from within CMG.

We require a minimum of two years programming experience. Experience on any commercial machines is considered relevant with experience of both mainframes and mini's being preferred. Similarly the particular languages used are not important but we prefer a knowledge of both high-level and low-level languages, with COBOL and any Assembler language being the most desirable.

Experience of project leading, customer involvement, management responsibility and sales involvement are not essential for all vacancies but some or all of this type of experience would be required for the more senior positions.

We require experience with commercial and financial applications with general accounting knowledge being the most useful.

**What's so special about CMG?**

We are a young company committed to:

- Building a successful company, wholly owned by those working in it, where each person could "be his/her own boss," to the maximum possible extent.
- Paying high salaries, providing top conditions, and pension arrangements in order to attract the best people in the industry, in return for hard work and maximum opportunity.
- Involving every member of the company in the decision making process through regular staff, management and policy forming meetings.
- Sharing profits, and enabling all staff to buy shares in the company.

At least three years' practical experience is essential with a knowledge of more than one type of computer being most useful.

Preferably you will have some experience of the responsibilities of working at a senior level. The ability to work with the minimum of

supervision is a basic requirement of our Operations Staff.

The work will involve responsibility for optimising throughput and quality of the work produced on our Burroughs and Honeywell machines.

**Where do I apply?**

Please write or telephone for an application form quoting ref: CW/28 to:

Ann Baird,  
CMG (City of London) Limited,  
Endgate, 73 Leaden Street, London, E1 8EY  
Tel: 01-481 3881

OR  
Bobby Rogers,  
CMG Computer Management Group  
(UK) Limited,  
Sunley House, Bedford Park,  
Croydon, CR0 2AP.  
Tel: 01-681 7631

Jane Loiner,  
CMG Computer Management Group  
(Middlesex) Limited,  
Westway House, 320 Ruislip Road East,  
Greenford, Middlesex UB6 9BW.  
Tel: 01-578 4653

OR  
Barbara Clark,  
CMG Computer Management Group  
(Southern) Limited, Sunley House,  
Bedford Park, Croydon, CR0 2AP.  
Tel: 01-688 8251.

Janet Gotthard,  
CMG (West End) Limited,  
Sunley House, Bedford Park,  
Croydon, CR0 2AP.  
Tel: 01-884 8251.  
(To be relocated in London)

**CMG**

London · Amsterdam · Frankfurt  
Rotterdam · Brussels · Glasgow

**Systems and Programming Consultants**

at CMG Middlesex at CMG West End  
at CMG City and at CMG Southern

**£4000 to £6000      £6000 to £8000**

**£8000 to £10,000**

**Operators**

at CMG (UK) Ltd..

**£3000 to £5000**

*Dependable*

## MINI ANALYST/PROGRAMMERS

### N. EUROPE

#### The Company:

Is a large international Consultancy and Systems Implementation group. In keeping with its prestigious reputation it urgently requires top calibre personnel to implement its rapid expansion programme and has retained Informatix to assist with their personnel requirements.

#### Technical requirements:

- A. Senior Analyst/Programmers having not less than 4 years' experience of design and implementation of Mini Computer systems for on-line and/or real-time applications involving Assembler level Programming in a Mini Computer environment.
- B. Analyst/Programmers having not less than 2 years' experience of Assembler Programming relating to Mini Computer applications.

**Prerequisites:**  
Ideally candidates should have a professional qualification or a degree equivalent preferably related to Computer Science, Mathematics, Science or related areas. Significant D.P. experience may be acceptable in lieu of the aforementioned requirements.



**SALARIES**  
COMPRIZE: Cost-of-Living Allowance Plus  
Basic U.K. Salary to £10,000++  
7% Holiday Bonus

#### The Prospects:

In addition to excellent salaries successful candidates will meet with technically rewarding projects and rapid advancement career prospects are open to those whose contribution enhance the prestige reputation and expertise of this group - a world leader in 'State-of-the-Art' systems implementation.

#### The Remuneration:

Generous relocation allowances will be paid to candidates and their families. Four weeks paid annual holiday plus 7% holiday bonus is payable in addition to salaries adjusted upwards to meet cost-of-living differentials. Temporary accommodation will be provided at the outset pending location of permanent accommodation.

#### Interviews:

To be held in London throughout the month of August. It is anticipated that employment offers will be made to successful candidates within 10 days of interview. Ref. 36/1

Telephone 01-491 4636



Avon House, 360-366 Oxford Street, London W1N 9HA.  
(Opposite Bond Street underground)  
Telex: 28800 ALPRESS LDN.

## Computer Operator c.£3000+25% shift allowance.

We operate on IBM 370/145 under OS/VS1 supporting batch and on-line applications. In addition there is a 370/148 scheduled for delivery in early November.

Because of this expansion we need another Computer Operator, who has at least one year's experience with OS/VS1.

A three-shift system is worked with weekend overtime as required. Working conditions and fringe benefits are excellent and relocation assistance is available if necessary.

For an application form ring Liz Gibney on Swindon (0793) 27812. (24 hour answering service).

**Hambro Life Assurance**  
Hambro Life House  
Station Road, Swindon SN1 1EL

## COBOL PL/I or BAL PROGRAMMERS & ANALYSTS

CENTRAL LONDON & S.W. ESSEX

3 1/2 % MORTGAGE  
GRADE 1 £5,500-£6,750  
GRADE 2 £4,500-£5,500

A well established Financial institution based in London with RJE facilities in S.W. Essex is seeking to recruit a number of experienced Analysts and COBOL/PL/I or BAL Programmers and Systems Programmers with strong OS backgrounds. A minimum of 2 years programming experience is essential and ideally exposure to either 370/138, 145, 165 or 168 would be advantageous. A strong background in Commercial batch processing is essential, whilst any on-line (CICS, IMS, etc) experience and data-base design would be desirable however, if necessary, training will be given in these documented programming procedures and senior applicants will have an in-depth knowledge of IBM utilities and JCL. These appointments will appeal to candidates desiring to develop into on-line applications with the added benefit of subsidised mortgage. Flexible working hours and other good fringe benefits are added attractions. Interviews will be held in London throughout August and early offers will be made to successful candidates.

Ref. 36/2



## ANALYSTS + PROGRAMMERS

LONDON AND OVERSEAS GRADE 1 £5,500-£6,750

SALARY TO £7000+  
Per Diem Allowance

An established U.K. Software House with extensive overseas operations is planning a major expansion programme and requires a number of Systems Analysts at various levels as well as experienced programmers. Ideally candidates shall have solid IBM OS backgrounds and programmers will demonstrate experience in AIMS COBOL (BAL would be an additional asset). In addition any experience within a Mini computer environment would be considered an advantage. In-depth exposure to OS JCL and Utilities is a prerequisite. These positions will appeal to applicants free to travel extensively overseas and to a lesser degree in the U.K. very generous allowances will be paid during such periods. Those positions are permanent and pensionable and candidates seeking long term career advancement will find considerable scope and opportunity within this progressive company. Interviews will be held in London throughout August and offers will be made to successful candidates within 1 week of interview.

Ref. 36/3

Telephone: 01-491 4636 until 7 pm



Avon House, 360-366 Oxford Street, London W1N 9HA.  
(Opposite Bond Street underground)  
Telex: 28800 ALPRESS LDN.

## CAREER OPPORTUNITIES IN NEW SERVICES COMPANY

### 1900 Hardware

Salaries c £5000+

### Birmingham based

The Company is a newly formed independent member of a large National Group, servicing the group's computing needs. So they can offer stability and security, along with the challenge of producing top quality work to an agreed timetable. The company's services are provided from a number of computer centres in the UK, of which the Birmingham centre is the largest, using an ICL 1903T with teleprocessing links. The company is actively marketing its services, and has need of top quality development staff. The vacancies all carry good benefits, and offer exceptional potential, as new advanced hardware is planned for the future. As the team is compact, these positions offer individuals the chance to make their mark on the company and to assist in the growth. They are all senior appointments, and the positions are as follows:

### CHIEF PROGRAMMER

You will have 1900 COBOL experience, and be capable of running a team of several programmers. It is a management position, reporting directly to the Development Manager, and offers scope to bring high standards to the team. You will be responsible for allocation of work, standard of programming, implementation, progress reporting and close liaison with Production Management. Recruitment of new staff and their training and progression will also be part of this job.

### SYSTEMS PROGRAMMER

Evidence of systems programming experience, including both high and low level languages, not necessarily ICL, is required. Driver, COMMS Manager, George 2 Plus and Maximap are all in use, and would become your responsibility. You would take control of all operations software, and advise on upgrades and new facilities. This is an interesting and challenging position, reporting to the Production Manager, and the future possibilities with hardware/software developments are most exciting.

### SENIOR ANALYSTS

Because the Company has to sell its services to its clients, the ability to deal with them in a professional manner is required. You will be expected to carry out feasibility studies, investigations, design and implementation. The application areas, in addition to the normal commercial systems, include advanced specialised developments closely meeting the specific business needs of the company's clients. It is a project leading role, reporting direct to the Development Manager, and experience of scheduling and staff control would be useful. One post may be available at a more junior level.

Please contact Mike Hession (Ref. CW17) for a confidential discussion and appointment to your convenience

**COMPUTER PERSONNEL CONSULTANTS 021-632 6848 (24 HR.)**  
4th Floor, The Rotunda, New Street, Birmingham B2 4PA



COMPUTER PERSONNEL CONSULTANTS

CV's To: P.O. Box 74 Brentwood Essex CM15 0BZ  
Tel: 0277 212021

### COMPUTER SYSTEMS LIMITED

#### IBM SYSTEM 3 RPG II

ICL 1900/2903  
COBOL and PLAN  
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B1700 TO 6700  
COBOL  
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IBM SYSTEM 32  
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IBM 370  
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U1100  
COBOL  
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H6000  
COBOL  
GCOS  
IDS

PDP  
BASIC +  
RSTS/E

LINSCOTT PROVIDE HIGH SALARIES WITH PROMPT PAYMENT, TAX ADVICE, LOW COST COMPANY FORMATION AND LAST BUT NOT LEAST, STRAIGHT FORWARD ANSWERS. WHY NOT TELEPHONE US NOW TO ARRANGE YOUR NEXT, OR FIRST, CONTRACT

MICROS  
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PDP 11/70  
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WHY WAIT?  
PHONE NOW!

### CONTRACT

### ICL SYSTEM 4 USERCODE

Ref. 36/4

# SENIOR SALES REPRESENTATIVE

We are Raytheon - manufacturers of computers, distributed processing and terminal oriented data communication systems for Airlines and Industry. Raytheon International Data Systems is responsible for the marketing, sales and service of its products in Europe, the Middle East, Far East and Africa. The Raytheon terminal systems are installed with over more than 80 airlines.

We are seeking a Senior Sales Representative who will be responsible for the sales and marketing of "Raycheck" - the new Departure Control System developed by Raytheon in close co-operation with leading airlines and airport authorities.

The person whom we are seeking should have at least 5 years experience in marketing with the Management Services

(D.P.) department of a major airline, or in selling of data-processing equipment to airlines and airport authorities. He should be in the possession of a Bachelors Degree in electronics and should reside in Holland.

He will report to the Sales Manager and will be supported by a good team of qualified System Engineers at the Headquarters in Amsterdam. English is the working language.

To the right applicant we offer an excellent salary and working conditions. For any further information, please write to: Raytheon International Data Systems, for the attention of Mr. J.O. Verschuur, 53 Spaklerweg Amsterdam, The Netherlands.

**RAYTHEON**

Raytheon International Data Systems, 53 Spaklerweg, Amsterdam, The Netherlands.



HADIAN COMPUTER SERVICES LTD.

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**CONSULTANTS, ANALYSTS AND PROGRAMMERS**

Our application software division needs staff at all levels with a good commercial background and a sound knowledge of RPG II and/or COBOL and/or BASIC, experience with MINIS, 2903, System 3, System 32, P410, P320, etc. would be an advantage. The challenge associated with supporting new users, and dealing with a wide range of systems should appeal to applicants. Salaries are negotiable, we provide a company car, and a good working environment.

This is an opportunity to join an expanding division of a successful public company, at our Newcastle head office, or in Nottingham. Write fully to

J. D. Westman  
HADIAN SOFTWARES LTD.  
Northumbria House, Samson Close, Killingworth,  
Newcastle-upon-Tyne

**ANALYST  
PROGRAMMER**

AP2/4 £3,021 - £4,194 Inclusive plus July 1977 National Pay Award.

Applications are invited from persons with at least some system analysis work. The duties of the post will include analysing and designing systems and computer programming in P.R.G. II. The Council currently uses an I.C.L. 2903 computer.

The Computer Section is located in Dartford within easy reach of A2/M2 and Dartford British Railway Station (35 minutes London Bridge).

A generous disturbance and relocation scheme is in operation.

Further details and application form, returnable by 22nd August, are available from Personnel Section, Manor House, Swancombe, Kent DA10 0BS, Tel. Greenhithe 042431, Ext. 27.

D → C → **DARTFORD**  
Borough  
Council

## HAYWARDS HEATH SUSSEX COBOL PROGRAMMERS SYSTEMS ANALYST/DESIGNERS

to £5,000 p.a.

Our client is a Company within a large profitable group with long experience in data processing. Applications are general commercial running batch and on-line with some teleprocessing.

Experienced COBOL programmers and Analyst/Designers are required to join a team recently relocated to Haywards Heath. The modern offices are conveniently located close to the railway station which offers frequent fast services to London and Brighton.

**tap**

Time and People Limited  
Tel: 01-836 0355  
Brettenham House, Lancaster Place, London WC2E 7EN

**URGENT  
call us  
today**

## Computer Auditor

Salary up to £7,000

We are looking for a Computer Auditor who is able to make an immediate contribution to the Audit of both current computer systems and major systems developments. Our Computer Auditor may well have a recognised accountancy qualification and will certainly have relevant experience in the D.P. Audit field. The job demands a self-starter who is capable of working with the minimum of supervision. Initially the job will be based in London but will move to Chatham late 1978 on completion of our new administrative building.

Salary in the £6,000 - £7,000 range. Fringe benefits are excellent and include a non-contractual annual bonus, non-contributory pension scheme and life assurance cover.

Assistance will be given with relocation costs where appropriate. Applicants should send details of career to date to:

H. F. Hughes,  
Personnel Manager,  
Corporation of Lloyd's,  
Lime Street,  
London, EC3M 7HA.  
01-623 7100 Ext. 2550

**LLOYD'S** OF LONDON

BECOME A  
TECHNICAL JOURNALIST

## ON COMPUTER WEEKLY

We are looking for writers to join the successful and experienced team in Computer Weekly.

Essential qualities are proven computer experience or a qualification in computer-related studies, plus the ability to write quickly, accurately and clearly to meet strict deadlines.

People with operations experience and/or an in-depth software background will be given priority for the current vacancies. However, if your experience falls outside these areas, and you are interested in joining the team, why not contact us?

Writing for Computer Weekly is a job that opens up interesting new career possibilities for DP people. If you think you can meet our standards contact Malcolm Pelet, Editor, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU, giving brief biographical details.

## WORCESTERSHIRE SYSTEMS AND PROGRAMMING OPPORTUNITIES

SALARY UP TO £5,500 P.A.

We have been retained to recruit Systems Analysts and Programmers for our client, a manufacturing based organisation and a market leader in its particular field. Based around sophisticated ICL equipment, their systems development plans are both ambitious and technically advanced and they

are utilising COMMUNICATIONS MANAGER for their on-line systems development plans, which include a network of terminal links throughout the UK.

### PROGRAMMERS

Candidates should have:—

- \* a minimum of two years' ICL COBOL/PLAN experience
- \* a desire to continue in the programming field using advanced techniques with the capability of understanding and applying such
- \* experience of GEORGE III operating system is desirable but not essential

\* Age range of between 24 and 32  
and be educated to degree level

Successful candidates will be given excellent working conditions, experience of the very latest computing techniques and relocation assistance, if necessary, to an area of low cost housing.

021-238 3781

REF NO 77/08/6

### SPECIALIST COMPUTER RECRUITMENT LTD.

**BIRMINGHAM** 021-236 3781 **FREEPOST**  
Freepost, Equity and Law House, 35-37 Great Charles Street, Queensway, Birmingham B32 8BR  
**MANCHESTER** 061-833 0676 **FREEPOST**  
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD  
**LONDON** 01-935 0671 **FREEPOST**  
Freepost 6, Blandford Street, London W1E 1JZ



## Edmund Howard's Client Album

### TEST PROGRAMMERS HERTFORDSHIRE SALARY C. £5,000

Experienced programmers are required to work in the Product Test department of our Client's Software Development Headquarters. Main responsibilities will include developing tests and conducting trials of newly developed software prior to general release. The ability to write comprehensive reports and negotiate test objectives is essential.

Candidates should possess a practical approach to problem solving and an appreciation of the eventual user requirements which should reflect in the completed product. Rapid career advancement is envisaged for those with relevant experience wishing to capitalise on their present expertise. For further details please quote CW149.

### DEVELOPMENT PROGRAMMERS

### HERTFORDSHIRE SALARY UP TO £6,000

One of the world's leading computer manufacturers is currently recruiting experienced programmers to work on the development of new products within their European Software Development Group. Candidates' experience should stem from a computer manufacturing background with a strong bias towards assembly level programming. A working knowledge of Disc based systems plus some communications experience would be a decided advantage.

This is a unique opportunity to join a rapidly expanding department where you can develop your talents to the limit. Career prospects are excellent within the department. For further details please quote CW149.

### SOFTWARE CONSULTANTS (1903 going to 2960)

A leading manufacturer of precision engineering products is currently seeking a software specialist with at least five years' experience in systems programming.

The person appointed will report to the C.S.M. and be responsible for software evaluation, software planning and maintenance and also the training of systems and programming staff in current software developments.

The company has plans to develop extensive real-time systems for its commercial and manufacturing activities. An ICL 2960 will be installed in a new computer suite towards the end of 1978 to support these developments and will utilise VME/B TPS 1900 and DME.

Current systems are based on an ICL 1903A running under G1+.

This is an ideal opportunity for someone who wants direct involvement in the software activities associated with a large scale real-time system.

For further details please quote CW160.

### ESSEX C. £6,000

Does your forte lie within the production of technical specifications and software manuals? If so, or even if you have two years' solid experience in a technical area, our client would like to meet you and perhaps offer you a more promising career.

Presently there are one or two qualifying factors. The Organisation concerned is a medium sized company, with a strong emphasis on training and computer applications who strongly believe that its 'biggest asset' is the employee. This healthy working environment enables them to produce one of the finest products in the market place.

Given you a wide opportunity for career progression with exceptional security, our client asks for people with the right personality to tackle and solve all manner of problems in close association with the software design and development team, and with the enthusiasm to meet and exceed the standards of the software documentation at every stage of their development project. For further details please quote CW151.

### TECHNICAL WRITERS HERTFORDSHIRE SALARY UP TO £5,500

Excluding-Howard & Partners  
Computer & Management Consultants  
100 Brighton Road, Sutton, Surrey SM1 1PL  
01-643 1211

## A MANAGEMENT APPOINTMENT

### SYSTEMS PROGRAMMING SALARY TO £7,500 P.A. MANAGER

A leading manufacturing based company situated in Worcestershire is seeking the skills of an experienced Senior Systems Programmer to join a team of specialists as a Manager. The team is currently supporting 2 x ICL 1800 processors, having a large network of terminals throughout the UK.

The company have ambitious development plans including an anticipated 2900 series conversion within the next 12 months.

Candidates should have:

- \* worked in an ICL environment having in-depth knowledge of the GEORGE III operating system.
- \* the ability to supervise and manage staff
- \* good experience of either COMMUNICATIONS MANAGER or DRIVER
- \* a degree level education and be aged between 26 and 35.

The successful candidate will be given excellent working conditions, experience of the very latest computing techniques including 2900 series training and if necessary, relocation expenses to an attractive housing area.

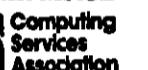
CONTACT: CATHY TRACEY 021-238 3781 REF. NO. 77/088.

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BIRMINGHAM 021-236 3781 FREEPOST  
Freepost, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST  
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6  
Freepost 6, 102, Blandford Street, London W1 1JZ



### Programming Lecturer

A well-established computer systems manufacturing company, located in Crawley, Sussex, requires a programming lecturer to supplement their current lecturing team.

Previous lecturing experience is desirable but applicants with a minimum of two years' programming in high level languages should not be deterred from applying. If no previous experience of instructing, training will be given.

The successful candidate will be expected to take over the running of some current customer training courses and to assist in the development of new training programmes as required.

Apply to: REDIFON COMPUTERS LTD., P.O. Box 2, Manor Royal, Crawley, Sussex. Telephone: Marion Barnes, (0293) 31211, Ext. 278.

### World leaders in data entry

**REDIFON**  
COMPUTERS LIMITED

University of Wales  
**UWIST**  
DEPARTMENT OF  
COMPUTING  
PROGRAMMING  
ADVISER

To help provide a Programming Advisory Service to staff and students in UWIST and to assist with the general running of the computer service.

Applicants should have a degree and be conversant with the university environment. They must have experience in FORTRAN, ALGOL or COBOL.

Salary: £2904-£4811  
Request (quoting Ref. CW) for details and application form to Personnel Section (Academic), UWIST, Cardiff CF1 3NU.

Closing date: 26 August, 1977

I. RYAN, OVALISCA IN RECRUITMENT CONSULTANT

HOWARD ORGANISATION INTERNATIONAL LTD.

MANOR WAY, BORCHAMWOOD, HERTS. TEL: 01-9534001

Role: DCO/0108/77

Salary: £2904-£4811

Request (quoting Ref. CW) for details and application form to Personnel Section (Academic), UWIST, Cardiff CF1 3NU.

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Request (quoting Ref. CW) for details and application form to Personnel Section (Academic), UWIST, Cardiff CF1 3NU.

Closing date: 26 August, 1977

I. RYAN, OVALISCA IN RECRUITMENT CONSULTANT

HOWARD ORGANISATION INTERNATIONAL LTD.

MANOR WAY, BORCHAMWOOD, HERTS. TEL: 01-9534001

Role: DCO/0108/77

Salary: £2904-£4811

Request (quoting Ref. CW) for details and application form to Personnel Section (Academic), UWIST, Cardiff CF1 3NU.

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Request (quoting Ref. CW) for details and application form to Personnel Section (Academic), UWIST, Cardiff CF1 3NU.

## Your Career in Computer Operating

We need additional operators for our Univac 1106 at Halifax and ICL 1900's at Bradford. If you have a minimum of 12 months operating experience on any hardware then ring or send brief details to Tina Black at:

Provident Management Services Limited

Colonnade, Sunbridge Road, Bradford, West Yorkshire, BD1 2LQ  
Telephone Bradford 33321 Ext. 231

Social Activities  
Sports and Social Club  
Athletics Competitions  
Dances, Local Squash  
Clubs

Salary to £4,114  
including Shift Allowance

Lifeline  
Inexpensive  
housing area  
Relocation  
Expenses  
Subsidised  
Meals  
Pension Scheme

## Technical Author

A well established computer systems manufacturing company, located in Crawley, Sussex, requires an experienced technical author capable of preparing hardware manuals. The job demands original writing from engineering drawings of digital systems.

The candidate (male or female) should possess an HNC in electronics or have equivalent knowledge.

Attractive salary plus removal expenses for the right person.

Apply to Redifon Computers Ltd.  
PO Box 2, Manor Royal, Crawley, Sussex  
Telephone Marion Barnes, Crawley (0293) 3121 ext 278.

World leaders in data entry

**REDIFON**  
COMPUTERS LIMITED

## Review Analyst for International Bank

Morgan Guaranty, one of America's leading banks is seeking a review analyst to work in its new administrative headquarters in Stratford, E15.

The position involves working at project leader level on the quality assurance team in the growing computer department which is currently working on a major automation project.

The resulting integrated systems, which will be implemented in phases over the next few years, cover all aspects of banking activity including Loans, Deposits, Foreign Exchange and Securities, and incorporate an on-line data entry and dealers enquiry system with many terminals.

The successful applicant will be an experienced analyst with particular knowledge of banking or financial systems, user liaison, inspection techniques and

systems reliability techniques.

He or she will play a monitoring role in all stages of systems development. Thus a realistic approach plus the ability to communicate will be valued.

The Bank pays particular attention to career development and provides both in-house and external training facilities.

An attractive salary will be paid reflecting the importance of this post. In addition, there are excellent fringe benefits which include an annual bonus, low-cost mortgages, non-contributory pension and life assurance and a staff restaurant.

Please write giving details of career to date or telephone for an application to Mr. R. Bingham, Morgan Guaranty Trust Company of New York, Morgan House, Stratford Centre, Stratford, London E15 1XB. Telephone 01-555 3111.

**Morgan Guaranty**  
Trust Company of New York

**McDERMOTT**  
SCOTLAND

**SYSTEMS ANALYST**

McDermott Scotland operate a Fabrication Yard on the Moray Firth near Inverness.

The Company have an IBM 370/125 computer used for Financial Accounting and Production Control systems. Due to further expansion we require a Systems Analyst who will play a key role in the continual development of the installation.

Supervisory experience is essential — a knowledge of IBM hardware and software desirable.

Preference will be given to applicants with 2/3 years' systems experience and a sound appreciation of Engineering and Financial systems.

The Terms and Conditions of Employment are attractive, and include a contributory Pension Plan and assistance with relocation expenses will be given where appropriate.

For further details and an application form, please write or telephone:

Personnel Department  
McDermott Scotland  
PO Box No 6  
INVERNESS  
IV1 1UP  
Tel: Ardraler 2561, ext. 466

## Systems Analysts

Surrey

Brooks Bond Oxo Limited are embarking on an extensive, planned development programme to investigate, design and implement our next generation of computer systems in the Sales Support, Distribution, Purchasing, Production, Inventory Control, Financial Control and Personnel areas.

These will be terminus-based systems with distributed intelligence, built around a communications network linked to our twin IBM 370 host configuration.

Advanced Database and Data Communications design techniques will be required to build the planned systems.

Applications are invited from Systems Analysts with at least two years' experience who feel they can contribute to the developments planned.

Based at Walton-on-Thames in pleasant local surroundings, the positions offer the opportunity to join project teams working flexi-time. Other conditions of employment are those of a progressive Company and salary is negotiable commensurate with experience.

Applications, stating age, experience and salary required, should be addressed to:

Mrs. V. C. Fairhurst  
Personnel Manager, Administration  
Brooks Bond Oxo Limited  
Lion House, High Street  
Grydon GR9 1JG

BROOKE BOND OXO LIMITED

## SOUTH MIDLANDS

### PAYROLL SYSTEMS SUPERVISOR

SALARY c£5,250 p.a.

A national manufacturing concern is presently involved in the implementation of a recognised package to standardise payroll procedures. They are currently undertaking some of the most sophisticated systems development within the UK, utilising both large IBM 370 series mainframes and mini hardware. Our client is seeking a Systems Supervisor within the Central Payroll Section to become the focus for other payroll sections in the UK, and with responsibility for analysts and programmers within the unit. Interested applicants should:

#### ESSENTIALLY

- \* around five years' systems analysis experience — some of this time to have been spent on payroll applications.
- \* man and project management skills in payroll and related areas in a manufacturing environment.
- \* degree or equivalent qualification

#### PREFERABLY

- \* detailed knowledge of UNIPAC
- \* programming knowledge

This is an excellent opening for an ambitious Payroll Professional to become involved in a position of interest and responsibility within an expanding sector. Excellent fringe benefits include a company car scheme and recently updated Pension Scheme.

CONTACT: DALE HADLEY

021-238 3781

REF. NO. 77/08/7

#### SPECIALIST COMPUTER RECRUITMENT LTD.

**BIRMINGHAM 021-236 3781 FREEPOST**

Freepost, Equity and Law House, 35-37 Great Charles Street, Queen'sway, Birmingham B3 2BR

**MANCHESTER 061-833 0676 FREEPOST**

Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

**LONDON 01-935 0671 FREEPOST**

Freepost, 6, Blandford Street, London W1E 1JZ

Computing Services Association

**SCR**

## AN OPPORTUNITY TO EXERCISE YOUR PROGRAMMING SKILLS IN A PRACTICAL ENVIRONMENT

This client is a UK major in fast moving consumer products. Marketing techniques are well developed and rely heavily on a sophisticated computer installation.

A Programmer is required to join the Sales Planning Department as Systems Planning Executive. He/she will use interactive facilities to design and develop systems for forecasting and analysis. He/she will be supported by a large 370 running CMS, using PL/I and some APL, and with a commitment to go MVS and TSO later this year.

### UP TO £5K

will be paid to the right candidate who, ideally, will be a numerate graduate with two years' programming experience.

He/she should be keen to have involvement with the main operating functions of the company (sales and production) and to see data processing being put to practical use at first hand.

**LOCATION: WEST LONDON** RW 32/1

**hutchinson-scoggins**  
recruitment

10 Dover Street London W1X 3PH Telephone 01-499 4501

## SENIOR APPOINTMENTS

### MIDLANDS

#### SALES MANAGERS — SENIOR SALES EXECUTIVES

£12K+ (no limit)

#### NEW OPPORTUNITY

Do you have a proven record of sales success in the commercial market?

Have you sales experience of computer systems, services or bureau?

Are you seeking the opportunity to grow your career and be one of the highest paid members of the industry?

A generous salary, car allowance and above average commission backed by full technical support, demonstration facilities and established user base will enable you to grow your career on the back of your success.

Ring immediately the advising consultant quoting Ref. No. CW 145.

#### MINI COMPUTER SYSTEMS



Insight Marketing & Personnel Consultants Ltd.  
72-75 Marylebone High Street  
London W1M 4AJ  
Telephone: 01-486 5844

## PROJECT SYSTEMS CONSULTANTS

### MAJOR PUBLIC ORGANISATION

Salary c£6K negotiable plus benefits

A major manufacturer is embarking upon a sophisticated research programme into the viability of future, co-ordinated, advanced systems for a MAJOR Public

organisation.

This is an exciting and stimulating project which will appeal to Business and Systems Analysts with a creative approach to the medium and long term needs of major

organisations.

Candidates must have at least five years' experience which should include large mainframe systems supporting on-line terminals. Although not essential, data base

experience would be an added advantage.

This is a unique and challenging opportunity which will offer an exciting and progressive career.

For confidential, initial discussion, please telephone the advising consultant quoting Ref. No. CW 146.



Insight Marketing & Personnel Consultants Ltd.  
72-75 Marylebone High Street  
London W1M 4AJ  
Telephone: 01-486 5844

## OS OPERATORS BASED SURREY & CAMBRIDGE

A progressive career awaits you at the two main centres of our Client's complex UK network. Based mainly on large 370's, the twin environments involve professional operators in:

- ★ Teleprocessing Techniques

You require:

- ★ 18 months' OS experience (knowledge of HASP would be useful)

With planned technical training, career progression will lead towards:-

- ★ Operations Technical Support
- ★ Junior Management
- ★ User Liaison
- ★ Other main-frame usage

Rewards include up to 22 days holiday, company products discounts, sports and social facilities and a salary commensurate with a major UK Group, heavily committed to Data Processing.

CONTACT: LONDON OFFICE ON 01-935 0671

REF. 77/08/10

**SPECIALIST COMPUTER RECRUITMENT LTD.**

**BIRMINGHAM 021-236 3781 FREEPOST**

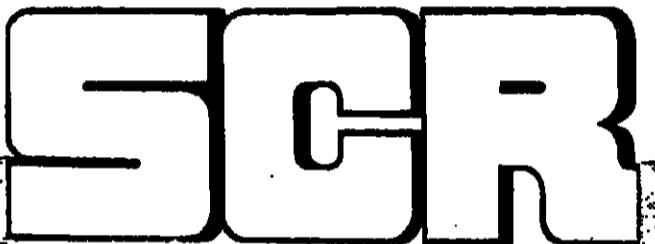
Freepost, Equity and Law House, 35-37 Great Charles Street, Queen'sway, Birmingham B3 2BR

**MANCHESTER 061-833 0676 FREEPOST**

Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

**LONDON 01-935 0671 FREEPOST 6**

Freepost 6, 102, Blandford Street, London W1E 1JZ



## OPERATOR WITH MORE TO OFFER?

If you feel that you are capable of more than just operating then you may be the Operations Assistant we are looking for. As part of a small but rapidly developing department you will immediately be involved in all aspects of the operation of our IBM System 3 Model 8 installation. In addition you will be expected to become rapidly proficient as an active R.P.G.II programmer.

If you are suited to the responsibility and opportunity offered, write giving details of career to date, to: R. J. Vivan, Systems Manager, Landex Ltd., P.O. Box 78, 207 Anerley Road, London SE20 8EW.

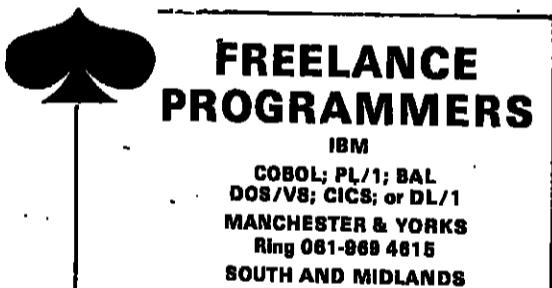
## Computer Operator

Due to an increase in our computing activity we need an ambitious operator with at least two years' experience of ICL 1900 series (George II) or 2903 (Exec 1) to join our small team of professionals operating a 24K 2903 with FEDS and EDS 305.

The computer operation is expanding and is expected to move to a 2 shift system later this year with generous allowances.

We offer excellent holiday entitlement, free life assurance, sick benefit and pension scheme, as well as an attractive salary for the right candidate.

Write for an application form to: Personnel Dept., Dexion Ltd., Maylands Avenue, Hemel Hempstead, Herts, or phone Clive Waite on Hemel Hempstead 2261.



### FREELANCE PROGRAMMERS

IBM

COBOL; PL/I; BAL

DOS/VB; CICS; or DL/1

MANCHESTER & YORKS

Ring 061-889 4815

SOUTH AND MIDLANDS

Ring Hitchin (0482) 55122



## SW HERTS Senior Systems Analyst

£5,500 - £6,000

This is an opportunity to join the Management Services Division of a large, successful manufacturing and distribution organisation, and to work to good professional standards in a well-established data processing environment.

Career prospects and job interest are good, due to a challenging schedule of development work and the implementation of further on-line systems. Employment conditions are excellent and relocation expenses will be met where appropriate. No significant travel is required.

The opening will interest Analysts with:

- several years' sound analysis experience and the competence to design and implement effective business systems
- The ability to communicate convincingly
- A good educational background - at least "A" level.

If you have an interest in Real Time or Teleprocessing and experience in COBOL we would like to discuss the future with you.

The factory is based in Hayes close to the M4 and the attractive benefits include an attractive pension and life assurance scheme, subsidised canteen, staff sales shop selling a wide range of foods and an active sports and social club. Join us now and you'll be joining at a very interesting time so why not give us a call and find out more. Contact David Taylor on the address below:



Tel: 01-637 5796

**EDP Systems**  
52-53 Margaret Street  
London W1N 7FF

## SYSTEMS ANALYSTS

If you are looking for an opportunity to join a team of top class professionals involved on a wide variety of commercial applications in Edinburgh then you may be the person we wish to recruit.

You will have a University Degree or equivalent professional qualification, together with a minimum of 3 years experience, including programming, plus proven achievement in the investigation, design and implementation of commercial systems.

Commencing salary including supplements will be not less than £4,500.

The Division pursues a progressive staff training and development policy. Benefits include a non-contributory pension scheme, 22 days holiday leave, flexible working hours and (where appropriate) House Purchase Facilities.

In the first instance, please write or telephone for an application form to: Mrs. M.C. Plinkerton,

Assistant Staff Controller,  
Bank of Scotland,  
2 Robertson Avenue, EDINBURGH, EH11 1PZ.  
Telephone: 031-337 2488 (Extension 186)



## Technical Author with computer experience?

There's a place for you in Paris

We're a major international computer manufacturer based in Paris and are at present looking for additional enthusiastic and ambitious Technical Authors to join our Publications team.

We need people with both sound writing ability and a good relevant technical background and as a wide variety of computer documentation is involved, you should already be a professional writer in the computer industry or, alternatively, have computer experience at analysis/programmer level and be interested in technical authorship.

Salaries are highly competitive and there is an attractive range of benefits of the kind you would associate with a large international company. We will, of course, assist with relocation expenses to Paris.

In the first instance, send your career resume to Position No. B61-1122, Austin Knight Limited, London W1A 1DS.

Applications are forwarded to the client concerned, therefore companies in which you are not interested should be listed in a covering letter to the Position Number Supervisor.

AK ADVERTISING

## Systems Analysts and Programmers

— this could be the start of something big!

At the Nestle's Production Unit in Hayes we are in the process of developing a comprehensive new Factory Support system. We are phasing out our present 1901 and replacing it by the use of a 360/50, 370/136 at our Croydon head office linked to Datapoint 2200 mini-computers at production centres.

We're looking for staff to join us at the initial stage to help establish the system and to develop and grow with it.

If you have an interest in Real Time or Teleprocessing and experience in COBOL we would like to discuss the future with you.

The factory is based in Hayes close to the M4 and the attractive benefits include an attractive pension and life assurance scheme, subsidised canteen, staff sales shop selling a wide range of foods and an active sports and social club. Join us now and you'll be joining at a very interesting time so why not give us a call and find out more. Contact David Taylor on the address below:



The Nestle Co. Ltd.  
Nestles Avenue  
Hayes, Middx.  
Tel: 01-573 381

# SENIOR APPOINTMENTS

LONDON AND HOME COUNTIES

## SALES MANAGER SENIOR SALES EXECUTIVES MINI COMPUTERS SALESMEN

They need professionals with at least one of the following:-

1. A major force in the mini computer market.
2. Recognised highly sophisticated hardware.
3. Enviable software support.
4. Dynamic expansion plan.
5. Superb career opportunities.
6. Well above average incomes.

Our clients will also consider Salesmen within other sectors of the industry if they are able to demonstrate the ability to assimilate knowledge quickly. The income package will be very attractive and will be negotiated with successful applicants, it is unlikely to be less than £11,000 p.a. This is a unique and genuine opportunity to leap into the sophisticated and lucrative end of the industry in terms of both status and income.



Insight Marketing & Personnel  
Consultants Ltd.  
72-75 Marylebone High Street  
London W1M 4AJ  
Telephone: 01-486 5644

We could write pages of the benefits regarding this client, but feel that more will be achieved by discussing the situation with the advising consultant immediately.

Please phone quoting Reference No. CW142 NOW.

## PROJECT LEADERS MAJOR COMPUTER MANUFACTURER

£5,500 TO £6,500 PER ANNUM

OPPORTUNITIES exist for individuals to join a major computer manufacturer and by your skills, knowledge and ability take the first steps on a CAREER PATH TO SUCCESS.

If you have experience in the following:-

Upgrade 3rd to 4th Generation  
Conversion — Systems and Programming  
Cobol

Immediate vacancies exist in the West Midlands to join an established team working on a large project for a company who are market leaders in their field.

YOUR SUCCESS over the next 10 months will lead to opportunities to work on other Major Accounts and YOUR PROGRESSION will only be limited by your own ability.

EXCELLENT SALARIES, expenses and all the benefits of a major company are available with the appointment.



Insight Marketing & Personnel  
Consultants Ltd.  
72-75 Marylebone High Street  
London W1M 4AJ  
Telephone: 01-486 5644

Telephone the Senior Consultant quoting Ref. No. 143.

## HEAD OF SOFTWARE

HERTFORDSHIRE — £NEGOTIABLE FROM £7,000 + CAR

This is a job for a software professional with proven management ability.

The company, a major international manufacturer, has embarked upon a challenging and exciting programme of applications development for distributed data processing systems.

They are seeking a manager with very broad experience in both operating systems and applications software. Ideal candidates will have gained relevant experience over a number of years with a major manufacturer, user or software house and will be particularly well versed in the environment of small business machines and communications.

This is a unique opportunity to demonstrate your management skills as the head of a large department at the forefront of computer technology. Prospects for promotion are excellent, a realistic salary and company car is offered together with large company benefits.



Insight Marketing & Personnel  
Consultants Ltd.  
72-75 Marylebone High Street  
London W1M 4AJ  
Telephone: 01-486 5644

Telephone immediately, the advising consultant, or write quoting Ref. No. CW144.

Ref. No. CW144

## EXCITING CAREER OPPORTUNITIES MERSEYSIDE

We are retained by our client, a major international engineering organisation with an advanced IBM 370 production/financial systems.

**SENIOR  
PROGRAMMERS**  
To £4,300

**SYSTEMS ANALYST**  
To £4,500

**PROGRAMMING  
CONTROLLER**  
To £5,000

Our clients are located in the North Merseyside area within daily travelling distance of the coast. Normal large Company benefits apply to these positions, including an above average pension scheme and relocation

CONTACT: DAVID WADE

Programmers with a minimum of 2 years' experience of Assembler and/or COBOL are required. Responsibility includes assisting with systems design, for which training will be given. Rapid development into systems is envisaged for applicants wishing to broaden their experience.

A systems analyst is required with accounting/payroll experience to design and implement a complex integrated payroll, costing and personnel system utilising the latest techniques. Some travel within the UK is envisaged with this post.

Our clients require a data processing professional to control and direct the programming resources of the installation. Responsibilities include: systems being developed and hardware requirements. He/she should have gained an in depth knowledge of IBM software/hardware.

Our clients are located in the North Merseyside area within daily travelling distance of the coast. Normal large Company benefits apply to these positions, including an above average pension scheme and relocation

CONTACT: DAVID WADE

081-833 0876

REF. 77/08/9

**SPECIALIST COMPUTER RECRUITMENT LTD.**

**BIRMINGHAM 021-236 3781 FREEPOST**

Freepost, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

**MANCHESTER 061-833 0670 FREEPOST**

Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

**LONDON 01-935 0671 FREEPOST 6**

Freepost 6, 102, Blandford Street, London W1E 1JZ

Computing  
Services  
Association

SCR

Hill Price Davison

## PROGRAMMERS UK & EUROPE

Hill Price Davison is a well-established and expanding Software House now in its fifth year of operation.

During this period we have built up a solid client base and maintain excellent relations with both our clients and our staff.

We now require additional programming staff for a wide variety of projects in the UK and Europe on both Mini and Mainframe Computers.

Programmers required for these assignments should ideally possess 5 years' computing experience but first-class people with less experience would be considered.

In addition to excellent salaries and bonuses successful applicants will be able to broaden their experience with a friendly and professional company.

Please telephone or write to:

Alan Isaacs  
**HILL PRICE DAVISON LTD.**  
Walham House, Walham Grove  
London SW6 1QP  
Telephone: 01-381 3266

MARCOL is an associate company of the Norwich Union.

# Computer Operators

As part of our planned expansion we are shortly installing a second S3/10 and in March 1978 replacing the S3/10's with an S3/15.

To cope with this growth we are increasing our operations staff and invite applications from operators with experience of one or both of the above computers.

Apply in writing giving full details of age, experience and present salary, to Personnel Manager, Lenthalic Morny Limited, Vale Road, Camberley, Surrey.

LENTHERIC MORNY

**Reed Executive**  
The Specialists in Executive and Management Selection

### Business Manager

(Computer Systems)  
U.K. and Europe

£9,500  
+car

Following internal promotion one of the major international companies manufacturing mini-computers requires a new Business Manager. Reporting to the Managing Director, responsibilities will include the marketing function in the U.K. and parts of Europe together with total involvement in the overall operational control. Candidates should be sales management of small-medium disk based business computers potential for career advancement. All normal large company benefits apply including any necessary relocation expenses.

Telephone 021-643 7226 (24 hr service) quoting Ref. 1329 CW.  
Reed Executive Selection Limited, 6th Floor, The Holunda, New Street, Birmingham B2 4BP.

The above vacancy is open to both male and female candidates.

London, Birmingham, Manchester, Leeds

437 557 557 day, 495 046 666

**CAPITAL APPLS.**  
FORTRAN  
Programmes urgently required for  
industrial and scientific development.  
£8,000-£9,000  
All areas  
Phone for free list of  
vacancies

**FACULTY OF BUSINESS (BARKING PRECINCT)  
DEPARTMENT OF SYSTEMS & COMPUTING STUDIES**  
**LECTURER II APPOINTMENT**

Applicants for this post should have recent commercial, industrial or teaching experience from among the areas of information systems, database technology and operating systems. Appropriate academic qualifications required and experience of ICL 1900 series would be an advantage

(Ref. 5/DE 120)  
SALARY SCALE: LECTURER II - £8,278-£8,482  
(plus appropriate Government Supplements of up to a maximum of £492 and appropriate London Allowance)

Further details and Application Form from -

The Senior Staffing Officer (2)  
North East London Polytechnic  
Finsbury Park, London E17 4JB

Telephone: 01-529 2000, Extension 20

Closing date - 12th September, 1977. Please quote reference no.

**HELP**  
North East  
London  
Polytechnic

**COMPUTER SERVICE  
ENGINEER**  
£5500+

Required by an American based company to work from home, ideally situated in the Manchester, Cheshire area. This position would suit a person with minicomputer experience and/or plotter experience, and should be sufficiently capable to command a salary in excess of £5,500 p.a. to start.

Training will be provided at company manufacturing facility located in California, U.S.A.

Please write in the first instance to: Box 1053, Computer Weekly.

**SOUTH WESTERN REGIONAL HEALTH  
AUTHORITY**

**SYSTEMS ANALYST**  
MARCOL BUSINESS MACHINES

An experienced Systems Analyst is required in our PRE-SALES Division, to support our sales team in selling PDP-11 based mini computers.

If you have the following qualifications:

(a) Good knowledge of commercial systems; sales order processing, accounting routines and payroll.  
(b) Previous experience installing mini-computer systems.  
Location: INITIALLY EAST MIDLANDS.

Please apply to:

David A. Heini, U.K. Sales Manager  
MARCOL BUSINESS MACHINES LTD.  
Clerken House, Clerken Street  
Manfield, Notts.  
Telephone: Manfield (0623) 36344

MARCOL is an associate company of the Norwich Union.

plus Phases I and II pay allowances  
(New entrants to the Health Service normally start at minimum of scale)

Applications are invited from qualified Systems Analysts, N.H.S. candidates with wide experience in Finance Departments.

The Computer Department situated at Dove Lane, Newfoundland Road, Bristol, is equipped with a Honeywell 2600 which will be replaced by an ICL 2980 and the region is also installing Data Communications Equipment for a number of projects including Stock Control.

Successful candidates will join teams developing new payroll, manpower and budgetary control systems.

Appropriate training will be given in all aspects of systems and associated projects.

Details and application form from the Regional Personnel Officer, Establishment Section, 26 King Square, Bristol BS1 8HY. Closing date 2nd September, 1977.

Application forms are obtainable upon receipt of a foolscap stamped addressed envelope from the Borough Treasurer, P.O. Box 54, Civic Centre, Silver Street, Enfield, EN1 3XF. The closing date is 19th August, 1977. Reference No. ORA/978 and the post in which you are interested must be quoted in all correspondence.

0010-4787

## ON-LINE DATA BASE CROYDON

### Exceptional Career Opportunities in a progressive IBM Installation



We are moving into the second phase in the development of two major tele-processing systems, based on an IBM 138 using CICS/VS and DL/I. In addition to the staff recruited as part of our recent campaign, there is now the requirement for the following DP personnel:-

#### SENIOR PROGRAMMERS

With three years' experience of COBOL and Leadership Potential.

#### PROGRAMMERS

With two years' experience using COBOL.

#### COMPUTER SHIFT LEADER

With minimum three years' experience on IBM 360/370 DOS Installation.

#### COMPUTER OPERATORS

With minimum 18 months' experience on IBM 360/370 DOS Installation.

If you have TP/Database experience so much the better (if not, we will provide training) but primarily we require WELL MOTIVATED PROFESSIONALS to join our enthusiastic teams working on systems which are of prime importance to the Company. Should you not fulfill these requirements, but have some Systems Analysis and/or Assembler experience, we would still be interested. Why not find out more about these openings and what we have to offer. Come along to one of our OPEN EVENINGS at Rothschild House, Whitgift Centre, Croydon (within a short walking distance of both East and West Croydon stations) on Monday 16th or Tuesday 17th August 1977 between 17.30 and 20.30 hours; when you can meet Alex Leonard (Management Services Manager) and his team for an informal discussion about career prospects and employee benefits within the Company.

If you are unable to call in on these dates, please telephone the Personnel Department - Tel: 01-686 5678 - for further details about current vacancies.

**Northern Star Insurance Co Ltd**  
Rothschild House, The Whitgift Centre, Croydon. Tel: 01-686 5678

**London Borough of Enfield**  
Applications are invited for the following vacancies in the Borough Treasurer's Department.

**Senior Systems Analyst**  
£5494 to £6055 (Post No. 218)

Applicants for this post should have a sound background in programming and systems analysis and some years' experience in Local Government or Commercial Data Processing.

**Senior Systems Analyst**  
£5494 to £5797 (Post No. 222)

The successful applicant for this post will be responsible for advising and implementing software; in addition to supervising programming standards.

**Programmer**  
£3694-£4072 (Post No. 225)

Applicants should have at least one year's programming experience with ICL COBOL. The Borough's Computer Installation currently consists of a 64K ICL 1902T and is developing 7602 terminal systems.

Application forms are obtainable upon receipt of a foolscap stamped addressed envelope from the Borough Treasurer, P.O. Box 54, Civic Centre, Silver Street, Enfield, EN1 3XF. The closing date is 19th August, 1977. Reference No. ORA/978 and the post in which you are interested must be quoted in all correspondence.

0010-4787

**DECISION DATA**  
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WE WILL TOP IT  
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## Sales Executive

Computer Services • c. £9,000 p.a.  
including Commission

Car Consulting Limited, a subsidiary of Aer Lingus, is a well established company principally dealing with software products and services. Turnover has trebled in the last four years and the growth has come from both the UK and overseas.

A highly competent and self-motivated successful sales executive is required to join their sales team to promote the company's extensive range of computer equipment and associated services.

Ideal candidates, men or women, will be over 25 with either experience

in a computer software business or with one of the major manufacturers. Alternatively they may have had experience in selling accounting systems.

Starting salary will be up to £9,000 p.a. but given success total earnings with commission should not be less than £9,000 p.a. plus car allowance. Location: Kensington with some travel outside London.

Please write in strict confidence giving brief details of qualifications and experience to David Hanly, PARC, 52 Poland St., London, W.I.

**PARC**  
Personnel & Recruitment Consultants  
A DIVISION OF AER LINGUS

## COBOL PROGRAMMERS

The ENGINEERING INDUSTRY TRAINING BOARD has immediate vacancies for enthusiastic COBOL programmers to join a progressive Computer team at their WATFORD Office.

The Board's ICL 1902S disc-based system is currently being used for Accounting, Register and General Commercial Applications and future expansion into the communications field is ensured with the installation of two ICL 7600 systems with Video Terminals.

Career prospects are excellent for PROGRAMMERS with a minimum of 9 months' COMMERCIAL experience.

### SALARY UP TO £3,787 (including Supplements)

Conditions of Employment include -

Paid Overtime as necessary  
50p per day Luncheon Vouchers  
23 days' Annual Leave

Contributory Pension Scheme

Sports & Social Club facilities

Relocation expenses as appropriate

Introspect?

Why not ring PETER HART, Chief Programmer, at WATFORD 44322, Ext. 31, or write for an application form to:

MRS. D. L. GYFORD  
PERSONNEL OFFICER  
ENGINEERING INDUSTRY TRAINING BOARD  
4 CLARENDON ROAD  
WATFORD WD1 1HS

We require a competent ELECTRONIC ENGINEER with a good knowledge of digital logic. Experience in both analogue and digital circuitry together with practical ability is essential. Salary is negotiable up to £3,200 depending upon qualifications and experience.

We are now seeking an experienced and energetic Systems Analyst to join the E.D.P. department based at our headquarters in the centre of Knutsford.

The person we are looking for will be aged 25-40, educated to a minimum GCE 'A' level or equivalent and have had 4-5 years computing experience of which a considerable amount should have been in programming or systems, in a responsible role.

Duties will include designing, testing and implementing new and revised systems and instructing users in the scope and use of systems facilities, as well as Systems Support and Maintenance.

The successful male or female applicant will be responsible to the Systems Manager and will receive an attractive salary and conditions of employment.

Existing holiday arrangements will be honoured.